The·Northwestern·Miller

MILLING PRODUCTION SECTION

IN TWO SECTIONS—SECTION TWO

FEBRUARY 14, 1945

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Volume 221 • Number

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Relative Susceptibility of Enriched and Nonenriched Flours to Insect Attack

By R. T. COTTON and J. C. FRANKENFELD, Bureau of Entomology and Plant Quarantine, U. S. Dept. of Agr.; and E. G. BAYFIELD, Dept. of Milling Industry, Kansas Agr. Exp. Sta.

REPORTS recently have been received from bakers to the effect that stocks of enriched bakers flour[1] in storage are deteriorating because of insect attack much more rapidly than stocks of unenriched flour. Experimental work has been conducted at Manhattan, Kansas, as a co-operative project by the Bureau of Entomology and Plant Quarantine and the Kansas Agricultural Experiment Station, to determine whether the addition to bakers flour of vitamins of the B group in the amounts specified by the enrichment program would increase the nutritive value of the flour for insects to an extent that would render the flour more liable to insect damage.

A considerable amount of research work has been done on the basic vitamin requirements of the confused flour beetle, Tribolium confusum Duv., and other insect pests of stored products. An excellent summary has been given by Fraenkel and Blewett (1943). According to these writers, all insects require vitamins of the B group, and at least seven of this group are essential for the proper growth and development of the flour beetle. These are thiamine (B_1), riboflavin (B_2), nicotinic acid, pyridoxin, pantothenic acid, choline, and biotin and possibly also inositol and p-aminobenzoic acid. According to these authors, some stored-product insects have lower vitamin requirements than others, possibly owing to the presence in their bodies of intracellular microorganisms, or symbionts, that provide accessory food substances. Fraenkel and Blewett state that the flour beetle does not possess these intracellular symbionts.

The larvae of the confused flour beetle thrive on patent flour, therefore it evidently contains all the substances vital to their development. It has been observed, however, that the flour beetle develops most rapidly on flour of high extraction. It is known that patent flour contains only a small fraction of the vitamins originally present in the wheat berry, but that the higher the extraction the higher the content of B vitamins in the flour. Evidently the greater growth rate in flour of high extraction is due to the presence of some growth-promoting substance in greater abundance than is found in flour of low extraction. According to Fraenkel and Blewett (1941), the riboflavin content of patent flour has the most marked effect of any of the B group of vitamins on the growth rate of the flour beetle.

Table 1.—The riboflavin content of various fractions of the wheat kernel.

Material	Riboflavin (mg./gm.) estimated by— Copping, 1943	Davis and Newland 1942	Barton-Wright, 1942	Andrews et al., 1942	Hodson and Norris, 1939	Conner and Straub, 1941
Flour of 73% extraction ..	0.85	0.83	0.75- 1.25	0.62	0.4	..
Flour of 85% extraction ..	2.00	2.14	2.00- 2.10	..	..	..
Flour of 100% extraction ..	2.30	2.78	2.65- 3.70	1.00	..	0.89-2.03
Weatings (middlings)*	4.00	5.90	..	3.80	1.3	..
Bran	4.80	..	5.00- 8.00	2.80	1.1	3.17
Germ	7.80 and 12	..	9.7 -12.85	..	..	3.78-5.56

*Bran and weatings comprise the balance of the wheat after removal of 73% as white flour.

The riboflavin content of various fractions of the wheat kernel has been determined by a number of workers, and Copping (1943) published a summary (table 1) of estimates made by six groups of scientists. As shown in this table, the riboflavin content of flour increases with the degree of extraction, and wheat germ, bran, and shorts contain a higher percentage of this growth factor than does flour.

[1]Bakers flour frequently consists of an 85% patent flour. In this article the two terms are used interchangeably.

It is generally considered that the rate of larval growth, as indicated by the duration of the period from hatching to pupation, constitutes the most significant criterion for comparing the efficiency of different diets. In the author's experimental work with the confused flour beetle both the rate of larval growth and the rate of reproduction were determined for ground wheat, bran, shorts, straight flour, clear flour, patent or bakers flour, and patent or bakers flour with vitamins of the B group added.

Whole wheat (100%), milled by a commercial mill, was separated into the following constituents:

Bran and shorts, 28.2%
Straight flour, 71.8%
Clear flour, 15%
Patent or bakers flour, 85%

Samples of the 85% patent or bakers flour were enriched as follows: (1) Patent flour + thiamine at rate of 2.25 mg. per lb; (2) patent flour + niacin at rate of 18 mg. per lb; (3) patent flour + riboflavin at rate of 1.35 mg. per lb; and (4) patent flour + iron at rate of 14 mg. per lb + all three vitamins at the above rates.

The Federal Standards of Enrichment call for a minimum addition per pound of flour of 2 mg. of thiamine, 16 mg. of niacin, 1.2 mg. of riboflavin, and 13 mg. of iron.

Five-gram samples of the various wheat fractions including the 85% patent (bakers) flour, enriched as indicated above, were prepared in triplicate and placed in cloth-covered glass vials 25 by 125 mm. Ten newly hatched flour beetle larvae were placed in each vial and all lots were reared to pupation in an incubator held at a constant temperature of 80° F. and a relative humidity of 75 to 80%. A record was kept of the date of pupation of each larva in all the samples. A second series was then run as a check. The efficiency of each of the various diets, as indicated by the length of time required by the larvae to complete their growth in the two series of tests, is shown by the data in table 2. Three groups of 10 larvae each were tested on each food.

Table 2.—Length of life of flour beetle larvae as influenced by diet.*

Food	Average length of larval life (days) Series 1	Series 2
Shorts	32.5	30.9
Whole wheat, crushed	32.8	29.1
Bran	33.3	32.6
Clear flour	36.5	31.2
Straight flour	37.6	34.1
Patent flour, riboflavin	38.4	35.9
Patent flour, riboflavin, thiamine, niacin and iron	40.4	35.3
Patent flour	40.8	36.0
Patent flour, niacin	41.1	36.2
Patent flour, thiamine	42.4	36.3

*The data shown above are averages for three colonies for each type of flour.

The results obtained in the two series, while differing slightly, are in reasonably close agreement. Since the development of the larvae reared on the patent flours was slower than that of larvae reared on the other fractions of the wheat kernel, these flours were the least efficient foods for them. Whether the patent flours were enriched or nonenriched made little difference in the length of larval life.

The Effect of Diet on Reproduction

The rate of reproduction of the flour beetle is another measure of the efficiency of the diet. To test the effect of the various foods on the productivity of the flour beetle, 200-gm. samples, in triplicate, of each of the materials used as larval foods were each placed in glass jars and artificially infested with 10 newly emerged female and 10 male adults of the flour beetle. All cultures were held at a constant temperature of 80° F. and a relative humidity of 75 to 80%. The cultures were examined at regular intervals and each week all progeny that had attained the pupal stage were removed and their numbers were recorded. The experiment was continued for 16 weeks. The number of progeny produced by each colony of flour beetle adults and the average number for each food are given in table 3. Bran was not included in this test, owing to the difficulty of separating the pupae from this type of food.

Table 3.—Rate of reproduction of flour beetle adults (10 males and 10 females per colony), as affected by diet. Average No. of pupae removed per colony from three colonies at end of week No.:

Food	7	8	9	10	11	12	13	14	15	16	Total
Shorts	81	394	346	318	203	151	117	54	22	7	1,693
Whole wheat crushed	10	215	276	221	125	77	56	31	15	17	1,043
Clear flour ..	5	135	217	198	109	71	32	13	4	7	793
Patent flour+ riboflavin ...	2	74	220	177	100	94	62	27	26	16	797
Patent flour+ riboflavin, niacin, iron and thiamine	0	75	201	176	101	74	54	29	20	15	748
Straight flour, 15% clear, 85% patent..	0	33	152	138	76	67	49	28	18	16	577
Patent flour+ niacin	0	13	112	119	69	57	55	26	17	7	472
Patent flour..	0	24	101	98	62	63	41	26	18	16	462
Patent flour+ thiamine ...	3	13	70	70	44	34	31	24	14	14	316

From the data in table 3 it is evident that the enrichment of bakers flour by the addition of vitamins of the B group had a more marked effect on the rate of reproduction of the flour beetle than on the rate of larval growth, as shown in table 2. Although thiamine and niacin are essential to the proper growth of the flour beetle larvae, the nonenriched bakers flour evidently contained enough of these two vitamins, because the addition of niacin had no significant effect on reproduction, and the addition of thiamine appeared to have a retarding effect. This retarding effect may have operated when all three vitamins were added to bakers flour, since the reproductive rate was slightly lower in the fully enriched flour than in flour with only riboflavin added. Apparently riboflavin was a major factor in increasing reproduction. By the addition of riboflavin to patent flour the rate of reproduction of the flour beetle on this diet was increased by 72.5% over that in nonenriched patent flour. In its effect on the reproductive capacity of the flour beetle the patent flour enriched with riboflavin was equal in nutritive value to clear flour, but it was far less nutritious than crushed whole wheat or shorts.

Relative Attractiveness of Enriched and Nonenriched Flours to the Flour Beetle

Tests were conducted in the laboratory to determine whether the enriched flour was more attractive to the flour beetle than the nonenriched flour. Paired lots of enriched and nonenriched flours were exposed to infestation by this insect over a 3-week period, but from the numbers of flour beetles attracted to the different lots of flour there was no clear-cut evidence that the flour beetle had any preference. In 50% of the paired lots the enriched flour attracted more beetles than did the nonenriched flour, whereas in the other 50% the nonenriched flour attracted the greater number.

Conclusions

Flour beetles probably are not attracted to enriched bakers flour more than to nonenriched flour. The larvae do not grow at a significantly faster rate in enriched flour than in nonenriched

(Continued on page 23a.)

Life Insurance for Leather Belts

By Lloyd M. Steirly
Power Transmission Engineer, S. R. Sikes Co.

ONE cannot help but think of the many conveniences and tools that we have to work with in reference to the available stocks of leather belting and the knowledge and research that go into building the leather belt of today. Our present day problems must be a bed of roses in comparison with those of earlier days as described in an article in the November issue of Milling Production. The article related the authentic incident in the boyhood life of the famous Civil War general, John A. Logan, who lived in southern Illinois. When John was sent with bags of corn for grinding to a grist mill some distance away, he was often obliged to stop all night at the mill. One incident connected with his experience in carrying corn to the mill illustrates the hard and awkward way men lived and labored in those days. The description of the incident follows:

"John, with one of the slave boys which the doctor—his father—then owned, and afterwards gave his freedom, went on a journey to the mill. They arrived at the mill in a terrible storm, and were obliged to spend the night in an open shed. The mill was run by horse-power, with the animal traveling in a circle at the end of a pole. The belting became soaked, and fell down in the night, where the dogs found it and ate it.

"So John and the slave boy had to stay for three or four days at the mill while the miller killed an ox, tanned the hide, and made a new belt."

When installing a new leather belt, do not neglect it because it is new, as it needs more attention during its break-in period than at any other time. The life of belting depends on its having proper tension and not being left too loose so that it slips and burns. It is always advisable to use new leather belting on corrugated roll drives and any old belting that has been reconditioned can be used on the smooth rolls.

Whenever possible on the installation of a new belt, it pays to run them in under a light load to limber them up and to work in the surface the same as one would do in breaking in a new automobile or other machinery. This gradual break-in procedure is especially important where pulleys are of small diameters.

The grain or hair surface and not the flesh side of a single ply leather belt should contact the pulley surface. It was a common practice years ago, and still persists in remote cases, to run the flesh side next to the pulley.

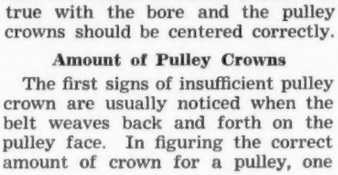
Belting a Roller Mill

When a new roll drive belt is installed on an "A" type roller mill, it is always best to install a set of new differential belts at the same time. By so doing, the stretch of the belts is equalized and alignment of the tunnel shaft is more easily maintained in relation to the roll shafts. Incidentally, the tunnel shaft alignment should be watched very closely at each belt adjustment as illustrated in the accompanying diagram.

There are two points to remember before belting a roller mill. Be sure that the rolls are in tram and that all the bearings fit accurately. A poor fit on a bearing will be the cause of throwing rolls out of tram when tension is applied on the belt. Be sure to check pulleys. The bore should have a fairly accurate sliding fit on the journal of the roll or shaft and the outside diameter should run true with the bore and the pulley crowns should be centered correctly.

Amount of Pulley Crowns

The first signs of insufficient pulley crown are usually noticed when the belt weaves back and forth on the pulley face. In figuring the correct amount of crown for a pulley, one



Pulley crown should not exceed one eighth inch for each 12 inches of pulley width. Two types of crown are shown above, exaggerated for purposes of illustration.

eighth inch for each foot of the width of the pulley's face has been the accepted figure for crowning pulley faces. Most generally a straight crown is used because it is easier to machine, but if used to excess of this scale, possible injury to the belt may result. Wherever possible, it is advisable to use radial crown. Illustrated are two sectional views of pulley faces showing the straight bevel crown and the radial crown types.

Pulley Alignment

Alignment is the most important single factor in transmission of power through belting and should be checked at regular intervals. Perhaps this is the most neglected detail and the cause of a large percentage of all belting failures and break downs.

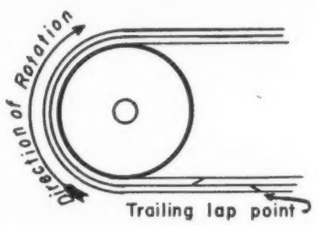
Leather belting is very elastic and flexible and will adjust itself to a gradual change of disalignment through its years of service, and when it is finally time to replace this belt with a new leather belt, a check of realignment should be made before installing the new belt so as to avoid taking a chance of severe injury to the new belt. By following this plan, much expense and loss of time will be saved.

If a belt runs to one side of a pulley, a good scale to use to determine whether the fault is in the belt or how it was installed, is to turn the belt inside out, running the top side of the belt next to the pulley. If after doing this it continues to run to the same side of the pulley, the difficulty lies in the misalignment of the shaft or the pulleys. If it runs to the opposite side of the pulley, the fault is in a defective belt.

Pulleys and shafts that are not in proper alignment are generally caused by ceilings that have sagged, floors that have heaved, worn bearings, loose hanger bolts or pulleys, all of which cause unnecessary increased belting expense and loss of production.

It is a common practice in many plants where belts are heavily overloaded to rub the surface of the belts with ordinary brown soap or to throw quantities of powdered resin on them. True, this treatment will make the belt grip the pulleys, but the only time there is an excuse for using this type of dressing is when an emergency shut-down will cost more than the possible damage or complete destruction of the belt. The user should compare the cost of a new belt with the cost of a shut-down and with these facts in mind determine whether it is better to use the sticky dressings, pull the load and run the chance of ruining the belt, or to shut down and clean off the belt with a recommended leather lubricating dressing.

If a sticky belt dressing has been used, the belt should be cleaned as soon as possible and a liquid leather dressing applied. If the belt is regularly dressed and is of sufficient size to do the work required of it, the time should never come when it



Shown above is the proper method of installation for an endless belt. Be sure that the lap point trails, preventing the joint from opening up.

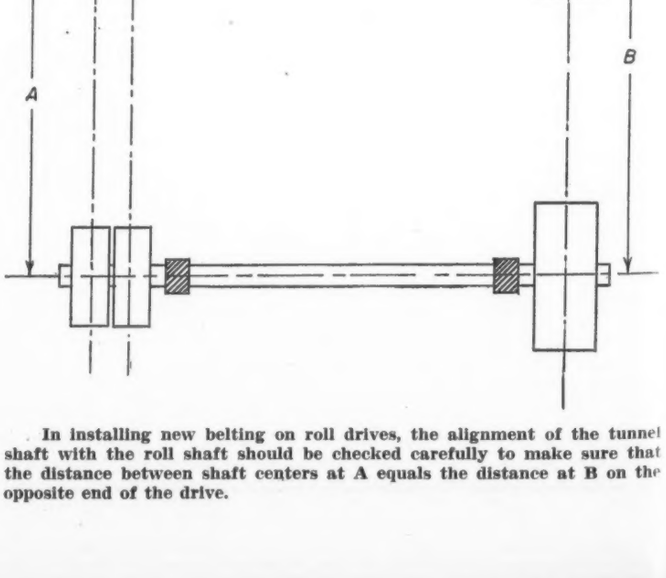
should be necessary to use ingredients such as brown soap, resin, petroleum pitch, asphalt, etc. These resinous substances penetrate the leather fibers, and, being dry and without lubricating value themselves, simply cause the fibers to tear themselves to pieces, thus weakening the belt and causing its ultimate ruin.

Efficient belt performance is impossible when excessive amounts of liquid or bar stick dressings are used. Excessive dressing, in every case, causes both the belt and pulleys to collect large quantities of dust which cakes and piles up on their surfaces, resulting in improper belt contact with pulleys, loss of valuable power, and general operating deficiencies. The intervals between dressings vary according to local conditions from a very few days to once in several months. A new belt should be dressed frequently until a prime pulling surface has been produced. A properly dressed belt feels mellow but not greasy to the touch.

Dressings and Dirty Belts

A dry surface on a leather belt will result in a hard glazing of its pulley surface and will greatly decrease its co-efficient of friction. This will cause an increase of slippage and create the hazard of burning from extreme frictional heat. The fibers in the leather will lose most of their strength and will cause drying out of the natural greases. Cracks will form across the outer surface of the belting, which will greatly reduce its strength and a break may follow. If this condition is not remedied, belt life will be considerably shorter.

Liquid or bar stick dressings such as used for leather belting should be carefully selected. Types produced or recommended by leather belt manufacturers can be best relied upon. Before applying, warm the liquid type of dressing to about 160° F. for best results. If properly applied to



In installing new belting on roll drives, the alignment of the tunnel shaft with the roll shaft should be checked carefully to make sure that the distance between shaft centers at A equals the distance at B on the opposite end of the drive.

both top and bottom faces of a double-ply or three-ply belt, the fibers will quickly absorb the oil through the pores, affording them a much needed lubricant. Dressing both sides of the belt is necessary because oils cannot penetrate glue layers between plies. By using liquid dressing sparingly, none will be permitted to stand on the belt surface and cause the belt to become soggy and lose its lateral stiffness. This is a most critical point and if not followed and watched carefully it would be better to not use any dressing—but of course the belt's life would be greatly shortened.

It is as important for leather belting to be dressed periodically as it is to lubricate any of the bearings or machinery in your plant to insure maximum life.

Belt dressings, however, will not carry the load alone and should not be used as a substitute for belt take-ups. If the above recommendations for application are followed, excessive amounts of dust will not settle and cake on the belts and pulleys.

Cleaning a Leather Belt

Cleaning of leather belts inside a flour mill or feed mill is an extremely serious fire hazard and should be done in the open or where ventilation is adequate. Many times where only a small amount of machine oil is present on a belt and where carbon tetrachloride is available, the oil may be wiped off with a cloth or a stiff jute brush, always bearing in mind to brush with the lap joints so as not to tear them up but rather keep them down.

When a belt is heavily soaked with machine oil, remove the belt from the drive, taking it outside of the mill, and soak it, overnight preferably, in a degreasing solution made up of one part carbon tetrachloride to three parts of unleaded gasoline. If carbon tetrachloride is not available, the belts can be soaked in any of the cleaning solutions used by dry cleaning establishments.

When removing the belt from the cleaning solution, most of the machine oil that has soaked into the fibers of the leather will be on the surfaces of the belt. Lay the belt out on a work bench or flat table and scrape off the surface greases with a blunt, squared-edge piece of steel or putty knife. Then allow the naphtha or cleaning solution to evaporate thoroughly and when the belt is completely dry, dress both sides of the belt with a dressing approved by a leather belt manufacturer. This will replenish the belt with the natural animal oils which were lost during the cleaning.

Care of Idle Belts

When any belt-driven machine or engine using a belt drive to a line shaft is retired or shut down for a considerable time, the leather belts should be removed, cleaned, dressed, rolled and stored. A leather belt left under tension, particularly in a dry atmosphere, will soon deteriorate and will not give good service later. When a leather belt is in constant service, its fibers remain flexible and the belt's oils are kept distributed throughout by the constant stretching and bending action as it passes over the pulleys. If left stationary, however, the fibers near the outside will dry out and checking will follow.

Leather belts should be slacked off, as a general rule, if the plant is shut down for a period longer than 24-48 hours.

OPERATIVE MILLERS MEET. — The above pictures were taken by this journal's cameraman at the annual business meeting of District 4, Association of Operative Millers, held in Minneapolis, Minn., Jan. 20. The men in the upper left picture are Ralph W. Bouskill, Western Canada Flour Mills Co., Ltd., Winnipeg, Man., and Charles R. Veeck, Eagle Roller Mill Co., New Ulm, Minn., retiring chairman of the district. Shown in the upper right picture are Otto F. Wilke, King Midas Flour Mills, Hastings, Minn., V. H. Reid, Hart-Carter Company, Minneapolis, and P. E. Putnam, Commander-Larabee Milling Co., Minneapolis. Two visitors from District 2 are shown in the left. They are Charles P. May (left) and B. L. Johnson (right), superintendent and executive vice president, respectively, of the Crete (Neb.) Mills. The three men shown in the right center picture are, from left to right: J. O. Schneider, Cannon Valley Milling Co., Cannon Falls, Minn., Olaf Myckleby, Duluth Universal Milling Co., Duluth, Minn., and A. N. Henjum, King Midas Flour Mills, Minneapolis. The man with the big pipe, shown in the lower left picture, is Charles Lang, engineer for the Russell-Miller Milling Co., Minneapolis. His audience is H. H. Trapp (center) also of the Russell-Miller company, and R. B. Dodds (right), manager of the Entoleter division, Safety Car Heating and Lighting Co., New Haven, Conn. The lower right picture shows C. H. Morrison and E. P. Farrell, both employees of General Mills, Inc.

POLICY OF FEDERAL INSPECTORS

By Walter H. Heath

Chief, Buffalo Station, U. S. Food and Drug Administration

INSPECTORS of the Food and Drug Administration engage daily in making sanitary inspections of food manufacturing plants. We have visited many baking plants and you may expect further visits from time to time. Our inspectors will survey your plant, your storage warehouse, your equipment, your raw materials, your methods, and when they have finished they will in the spirit of co-operation point out to you the conditions which are believed to be possible contributors of filth to your finished products, if any exist.

Such advice will be freely given. It will not be intended to be all-inclusive, and you should not assume that correction of the conditions mentioned will be all that is needed, for it is your job, your responsibility to place and to keep your plants in proper sanitary condition. You are not to believe either that because advice is given you will have ample time to make corrections and that no further action will be taken meantime. Whether action is taken or not, will depend on the circumstances and conditions found, not on profession of good intention.

The law authorizes seizure for confiscation of products violative of its terms. It provides for criminal prosecution of violators. It provides for the institution of injunctions to restrain violations. This administration considers that there can be no adequate excuse for poor housekeeping in food manufacturing plants. It feels its responsibility to protect the consuming public from dangerous and disgusting filthy foods. It is daily applying the three punitive provisions of the law named. Vast quantities of filthy foods are being removed from the market by seizure. Violations are being prosecuted with serious penalties. Injunctions are being obtained to prevent subsequent violations. This administration intends to continue to apply the provisions of the law to these forms of violations.

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Editor's Note.—These remarks by Mr. Heath were made at the recent meeting of the Pennsylvania Bakers Association.

A Miller Reports on

Wartime Milling Problems in England

And Their Solution

Editor's Note.—The following article by "North Mill" is reprinted from a recent issue of Milling, a British industry journal published in Liverpool. British mills were required, at the outset of the war, to increase flour extraction to 85%, to incorporate other cereals with wheat in the mill-mix, and to grind a larger amount of home-grown wheat. These requirements introduced many problems. "North Mill" tells how many of the problems were tackled.

THERE is at all times one main technical problem which all millers have to face, and that is the production of flour of a satisfactory quality at an economic price. This question of producing flour of a good quality is just as important today, and on examination most problems in the mill have an important relation to the necessity of maintaining a good quality flour at all times. The baker wants a flour that is reliable, and regularity should be the goal of all millers. Most of the subjects discussed in the following paragraphs have a distinct bearing on the maintenance of a regular flour.

Sprouted English Wheat

Probably the most awkward problem facing large numbers of millers in England today concerns the condition of much of the home-grown wheat. Among the many difficulties which naturally follow wretched weather during harvest, that of dealing with sprouted wheat is the one which has caused most anxiety to millers. Many people who handle wheat have become "maltose-minded" for the first time in their careers, as a result of the large amount of seriously sprouted wheat on the market. Of course, millers in general were well acquainted previously with the significance of the percentage of maltose in flour, but it is certain that they have never before been called upon to deal with the problem of sprouted wheat on anything like the present scale, because a minimum percentage of home-grown wheat has to be used today, whereas under prewar conditions much of the sprouted wheat would automatically have been used for feeding to stock.

The use of sprouted wheat in the grist is unavoidable under the existing regulations in many counties, and thus there is a very real difficulty in keeping the maltose figure of the flour below the danger line.

Unfortunately, it is not always the poorest looking samples of wheat which have the highest maltose figure. Sometimes wheat which looks fairly innocent on a casual inspection is found to have a dangerously high maltose figure, and close examination with the aid of a magnifying glass may reveal the early signs of sprouting in nearly all the grain.

The means by which the undesirable characteristics of a high maltose figure can be minimized in the baking process have frequently been explained to millers by the cereal chemists and need not be discussed in this article, but there are other practical difficulties which arise in the mill when handling large quantities of sprouted wheat.

First of all, when the wheat is delivered to the mill, a decision has to be taken promptly as to whether to grade it as millable, potentially millable, or nonmillable, according to the degree of sprouting.

This is not easy when the majority of the wheat received may contain between 10% and 25% of sprouts. The only quick test which can be suggested is to take a representative sample, mix it up well, spread it out, and count out 100 grains, sorting them into piles of sound wheat and sprouted wheat, a rough percentage estimation of the damaged wheat present thus being obtained. Unfortunately, it does not follow that the maltose figure will be in accordance with the percentage of sprouted wheat, but it is some sort of a guide, and wheat containing less than 15% of sprouts can usually be passed for milling without further testing. All samples containing over 15% of sprouts should be treated as suspect, and should be sent away for analysis, being meanwhile accepted as potentially millable wheat. Most of these latter wheats will have a high maltose figure. Ideally, every sample of wheat which is at all sprouted should be tested for maltose in a season like the present one, but this, of course, is not possible, unless each lot of wheat is to be sampled on the farm and tested for maltose before sale. As things are at present, the miller has an almost impossible task in keeping the separate identity of suspect parcels when they are delivered in before analysis for maltose content.

The maltose figure of the resultant flour can, of course, be affected by the type of milling processes to which the wheat is subjected. Unfortunately, the use of fluted rolls, which are necessary on the coarse reduction stocks, in order to reduce the scutellum sufficiently to maintain the B_1 content of the flour, will tend to increase the maltose figure of the flour at the same time. What is wanted is some means for separating the scutellum from the endosperm and the bran and grinding it down alone. Whether this happy state of affairs will become a practical operation in the future remains to be seen. It would enable the miller to make a really white flour with a high natural B_1 content.

Flour Extraction

A problem which has loomed large in the minds of the majority of mill managers is that of obtaining the minimum statutory flour extraction. In producing white flour, even when a minimum extraction of 75% had to be obtained, the miller could afford to play safe by milling to a length comfortably above the regulation figure, because the difference in the quality of the flour judged on the basis of the degree of contamination by bran powder when making an extraction of 75½% was hardly discernible from that when milling to a length of 75% exactly. When milling to an 85% extraction, the question is not quite so simple. On the one hand, the miller must obtain each week the extraction laid down by the authorities, but at the same time he cannot afford to exceed the minimum to any considerable extent if the quality of the flour is to be in the top class. At the higher extraction level, any additional yield of flour is largely composed of bran powder, and thus the effect on flour quality is much more noticeable than is the case for a similar additional yield of flour when milling to a length of 75%, as in the latter case the wheat feed contains a fairly large amount of endosperm in any case, and it is mainly this endosperm which will make up any small additional yield of flour. The problem of milling as close to the minimum extraction as possible is best solved by endeavoring to keep the milling conditions as regular as one can.

In order to keep the extraction regular day by day, it is, first of all, essential to keep accurate production records and to check up on these most carefully. The wheat weigher ahead of the first break rolls should be examined regularly to insure that it is weighing correctly. Although the official method of calculating the length is on the total products basis, the extraction based on the first break wheat weigher is a convenient figure for checking up from shift to shift. The flour and wheat feed packing off weighers should also be checked daily to see that all weighing is accurate.

The importance of careful timing and booking up at the end of each shift should be explained to the packers, so that the correct amount of flour and offal is recorded to each shift. Any attempt on the part of one shift to gain an advantage over the others by booking more flour and less offal than is their true production should be severely dealt with.

To aid the manager to know each day how the total flour extraction from the beginning of the week stands to date, it is very helpful to keep a progressive extraction sheet, on which the total net flour, wheat feed and screenings made on each shift are added to the totals for the previous shifts, so as to enable the total products extraction since the week-end and up to date to be calculated. If the manager waits to the end of the week before making any exact calculation of the yield on a total products basis, he may easily find that he is some way out from the statutory figure, and it is then too late to do anything about it for that week, whereas when a progressive extraction is recorded any tendency to be too low or too high can be countered with a minimum of delay.

Another point to remember when attempting to establish true extraction figures as the prerequisite of regular milling conditions, is that it is necessary to devise a scheme for the regular admixture of screenings into wheat feed. For example, a mill may receive a large quantity of imported wheat during one week and then two or three weeks may pass before any more arrives, with the result that a considerable quantity of intake screenings are booked to one week and none for the following weeks. If the intake screenings from the silo are all ground, and mixed into wheat feed during one week, the effect will be to reduce the extraction for that period, while in the following weeks the benefit of the fact that no intake screenings have been mixed in will be reflected in the results. Such irregularities must be ironed out as far as possible by mixing in all screenings at a steady rate, making only slight adjustments when the need arises. This particular point can have a fairly substantial effect on the calculation of flour extraction, as the intake screenings may amount to from 0.25% to 0.5% of the weight of the wheat ground over a period, depending on the amount of screenings carried out before the wheat is stored.

Having established a reliable book-

OFFICERS OF MILLERS GROUP.—Members of District 4, Association of Operative Mills, elected the men shown above as officers of the group to serve during the year at the annual business meeting held Jan. 20 in Minneapolis. The men are, left to right, C. O. Spencer, General Mills, Inc., Minneapolis, chairman; LeRoy B. Frentz, Hubbard Milling Co., Mankato, Minn., vice chairman, and William Howie, J. K. Howie & Co., Minneapolis, secretary and treasurer.

ing system and seen to the systematic disposal of all the screenings, the miller is in a much better position to control the extraction of flour obtained from day to day. The main factor with which he has to contend is, of course, the weather.

A sudden change in temperature affects the extraction to a marked extent. In the writer's experience, a 10° F. rise in temperature will reduce the extraction by approximately 1% if the moisture of the wheat and the rate of feed to the mill remain unaltered.

Of course, this is not a hard and fast relationship, as the humidity will also have to be taken into account, though this does not seem to have such a great bearing as temperature does on flour extraction, and the variation in humidity inside the mill is not so very great as a rule. The only satisfactory answer to weather variations is in the provision of air conditioning, and that does not seem to be a paying proposition yet, although it will surely have to become general practice in the future. In the meantime, what can the miller do about the weather changes he experiences? The gradual drop in temperature from summer to winter can be met by slight progressive increases in the moisture content of the conditioned wheat, but this is a long term policy and cannot be used to cope with the sudden and violent changes which sometimes occur overnight. The most satisfactory way to deal with these changes is to alter the rate of feed going to the first break rolls, as this alteration can be made at a moment's notice and will correct the extraction within limits, without any serious alteration to the quality of the flour.

Accurate control of the percentage of moisture in wheat is a most important part of the milling process and it is not easy to achieve. Unfortunately, the methods at present available for the addition of moisture to wheat in commercial practice are not as reliable as they ought to be when the importance of accurate conditioning is fully appreciated. It is not too much to say that the miller who can calculate the precise moisture content of each grade of wheat when it finally reaches the first break rolls, and who can maintain similar conditions as long as he requires them, has a technical advantage of the greatest value.

In devising a scheme for such careful control, the important factor is to bring all the wheat of the same group to a common moisture level at an early stage of the tempering process, so that in the later stages the washer feed will not vary on any particular group, and thus a standard washer immersion and conditioner setting can be employed for all wheat in the same group, thus making control easier from day to day. To do this, it is necessary to decide on a standard washer inlet moisture. All the dry wheats will have to receive individual damping according to their moisture content on arrival at the mill, designed to raise them precisely to the standard figure. Similarly, damp English wheat will be dried down to a common level of moisture before washing.

A practical difficulty which the writer has experienced in recent months has been to reduce the moisture of the wheat on to the mill sufficiently for the requirements of the present time. It is well known that before the war many firms milled Manitoba wheat at 18% of moisture and English at 15 to 16%. Today, in order to obtain a thorough clean up of the bran and thus reach the regulation extraction of flour, and also in order to reduce the scutellum sufficiently to keep the B_1 content of the flour high enough to satisfy the nutritional standards desired by the Ministry of Food, the moisture content of the wheat going to the mill has been reduced very considerably compared with prewar practice, so that at the present time Manitoba wheat is being milled with 15½ to 16% of moisture and English wheat at 14% or less.

It is difficult to find a means of washing wheat satisfactorily without permitting it to pick up a high percentage of moisture in the process, which would involve heavy drying to reduce the moisture content of the wheat after washing to present day levels for milling. It is, of course, advisable to wash all wheat, but the moisture pick up which results from the full immersion on washers of the Mumford type with separate whizzer may be as high as 4%. Even on the combined Mumford machine, the full immersion results in a 3% pick up as a rule. Obviously, in the case of English wheat a thorough immersion cannot be given to parcels with a high natural moisture content, if the wheat is to be milled with not more than 14% of moisture, unless the capacity of the conditions is greatly in excess of normal requirements and the consumption of fuel is to be high.

The main value in washing wheat lies in the wet whizzing or scouring which the grain receives. Providing the whizzing is thorough, little water need be used to clean the grain adequately. On the Mumford combined type of washer and whizzer, the wheat can be spouted into the extreme end of the stoning worm and so almost direct to the whizzer. On those washers which incorporate a rinsing worm, the difficulty can be

(Continued on page 25a.)

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Protection of Stored Grain

By Dr. R. T. Cotton

Editor's Note.—The accompanying article originally appeared in The Journal of Economic Entomology. The author is a leading authority in his field and is senior entomologist, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture.

PROTECTION of our vast stores of grain and dried processed foods from insect attack is of vital importance to the welfare of this nation and indeed the entire world. With greatly increased production of wheat, corn and oats, in addition to large yields of rice, barley, rye and other grain crops, the value of our raw grain foods can be figured in billions of dollars. The processing of portions of this vast store of raw grains for human consumption adds still more to its value.

Investigations during the past few years by state and federal workers have greatly increased our knowledge of the insect problems connected with the safe storage of these food supplies, and the development by them of improved methods of storing and handling large surpluses of grain should insure against serious loss from insect damage.

The fundamentals of safe storage for grain are now well established. If grain can be kept dry, cool, and clean, it can be stored for years without appreciable deterioration or loss from insect attack. The most serious insect pests of stored grain are the rice weevil, Sitophilus oryza (L.), the granary weevil, S. granarius (L.), and the lesser grain borer, Rhyzopertha dominica (F.), and a group of miscellaneous beetles referred to as bran beetles. A few moths, notably the Indian-meal moth, Plodia interpunctella (Hbn.), and the Angoumois grain moth, Sitotroga cerealella (Oliv.), are destructive in certain sections of the country and under certain conditions, but they are rarely as important as the coleopterous enemies of stored grain. The weevils attack and destroy sound, unbroken kernels, so their powers of destruction are considerable. The bran beetles, on the other hand, feed largely on grain dust and broken kernels. Their presence in large numbers induces heating and later spoilage of the grain due to the condensation of water vapor on the cool surface grain.

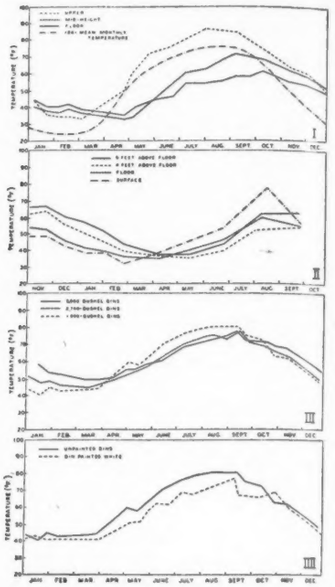

Fig. 1.—I.—Temperatures observed in the center, at various heights, in a 2,000-bu steel bin of corn at Ogden, Iowa, during 1941. II.—Mean temperature of central column of grain in 2,740-bu steel bins at Jamestown, N. D., 1941-42. III.—Mean grain temperature in unpainted steel bins, Hutchinson, Kansas, 1942. IV.—Mean grain temperatures in white-painted and unpainted 1,050-bu steel bins, Hutchinson, Kansas, 1942.

All these insects have certain temperature, moisture, and food requirements. In the absence of the proper combination of these requirements they cease to be a menace.

Bran beetles do not lay eggs at 65° F. or below. Grain weevils may lay a few eggs at this temperature, but in general little insect activity occurs until the grain temperature exceeds 70°. If grain has a moisture content below 9%, weevils do not breed in it, and little breeding is likely to occur in grain with a moisture content below 11% unless the temperature of the grain is abnormally high (90° F. or above). Bran beetles will breed in grain of almost any moisture content if the temperature is above 90°, and at temperatures as low as 70° if plenty of grain dust or broken kernels are present.

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wheat from insect damage differs somewhat from that of corn. Wheat is not stored in slatted cribs until the moisture content is reduced, but is placed immediately in tight storage. Field infestation is infrequent, except in regions where the Angoumois grain moth is abundant. Grain moistures at harvest time vary with the region in which wheat is grown but are usually favorable for storage. When grain moistures are above 12% they can be reduced by drying. In some sections, notably the spring wheat region, there is little hazard from insect attack in small bins of grain, owing to the cool climate, which prevents grain temperatures from ever reaching a level favorable for insect development. Figure 1-II shows optional average temperature of the grain in the center column of 2,740-bu steel bins at Jamestown, N. D., from November, 1941, to September, 1942. It may be noted that the temperature of the surface grain rose above 70° F. only during August and that the temperature of the grain at other depths remained below 70° throughout the year.

In larger storehouses, such as have been used in Canada in recent years for emergency storage, the value of the cooling effect of winter is in part lost, owing to the insulating properties of bulk grain, and fumigation must be resorted to when infestations are present.

In the southern portion of the wheat growing region of the United States the insect problems of wheat storage are more acute. Wheat can be stored successfully, however, in southern Kansas, the panhandle regions of Oklahoma and Texas, and regions with similar climates. Grain temperatures in steel bins can be maintained at relatively safe levels throughout the year. As shown by temperature curves of figure 1-III, mean grain temperatures in 1,000-, 2,740- and 5,000-bu bins exceed 70° F. only for a short period each summer. It has been found that if the outsides of these bins are painted white, the grain temperature remains considerably cooler and the period during which insects can damage the wheat is much reduced, as shown in figure 1-IV.

Insects flying into the bins during July, August and September augment the insect population and start dangerous infestations when grain temperatures are favorable for reproduction. By fumigating infested wheat late in August it can be placed in condition so that it can cool normally in the fall and winter and remain in good condition until late summer of the following year. If the fumigation is not 100% effective, but is reasonably good, the natural cooling of the grain will cause the death of a majority of the survivors.

The discovery that fumigants are retained by wheat in steel bins for periods as long as two or three months after treatment suggests the latter part of August as a favorable

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time for fumigation. Insects that may have entered the bin during the summer are killed, and the residual gas will protect the wheat from any migrating insects until protection by colder weather becomes effective.

Table 1.—Dosages of fumigants for use in steel bins.

Fumigant	Dosage per 1,000 bus Wheat gals.	Corn gals.
Carbon disulfide	1	1.5
Carbon tetrachloride (CCl_4)	3	4
Carbon disulfide-carbon tetrachloride 1:4 mixture	2	5
2 lbs chloropicrin+carbon tetrachloride to make 1 gal.	1.5	1
Ethylene dichloride-carbon tetrachloride 3:1 mixture	4	5
2 lbs 1,1-dichloro-1-nitroethane+CCl_4 to make 1 gal	1.5	1
1 lb B-methylallyl chloride+CCl_4 to make 1 gal	2	2
Ethylene dichloride-CCl_4 3:1 mixture+10% methyl bromide	2	2
Ethylene dichloride-methyl bromide 9:1 mixture	2	2
Carbon tetrachloride-methyl bromide 9:1 mixture	2	2
Methylene chloride-methyl bromide 9:1 mixture	2	2
Propylene dichloride-methyl bromide 9:1 mixture	2	2
Propylene dichloride-CCl_4 3:1 mixture+10% methyl bromide	2	2

Dosages of common grain fumigants satisfactory for use in steel bins are given in table 1 for both wheat and corn. Wheat stored in wooden farm-type bins in the Deep South will require more frequent fumigation and larger dosages. More frequent inspection will also be required to prevent damage before remedial measures can be applied.

In terminal elevators the methods of grain storage and treatment have not changed materially in the last few years. Although the principles governing grain conservation are the same for both farm and terminal storage, facilities are available for handling and treating grain in the latter that are not available on the farm.

Fumigants containing methyl bromide or chloropicrin may cause reduction of germination even in low-moisture wheat. The recent work of Smith & Staten (1942) indicates that damage to the germ of wheat by fumigants may impair the baking values. The heavier-than-air fumigants are often retained a long time by wheat in steel bins (2 to 16 weeks in actual trials) and probably also in concrete or steel elevator bins. It should be noted that although this enhances their insecticidal action in some cases, it also increases their adverse effect on germination.

Seed Conservation

In conserving seed from insect attack it is necessary to avoid treatments that will injure germination. With many fumigants germination injury is increased if grain moisture is above 12%, the concentration excessive, or the exposure period prolonged. Seed that has a moisture content of more than 12% should not ordinarily be fumigated. It has been found, however, that the 3:1 mixture of ethylene dichloride and carbon tetrachloride will not injure germination of grain, regardless of its moisture content, the concentration of this fumigant, or the length of exposure.

Bulk seed is liable to retain fumigants unduly, hence should not be treated with chloropicrin, methyl bromide, or mixtures containing these chemicals, unless the seed can be thoroughly aerated after an exposure period of 24 hours. The practice of mixing crystals of paradichlorobenzene with seed for long-time protection is not safe, although the vapors from naphthalene appear to have no deleterious effect upon germination.

Some seed disinfectants appear to have excellent insecticidal properties and will protect seed from insect attack. Seed treated with 0.2% by weight of a dust containing 8% of mercuric phenyl cyanamide and 2.5% of cadmium oxide as active ingredients, or with 0.3% by weight of a dust containing approximately 50% ortho benzo-quinone dioxeme peroxide as the active ingredient has been found to be rendered safe from insect damage. These compounds, however, and all other seed disinfectants for that matter, must be considered as poisonous, and no seed that has been treated with them should be used for animal feed or human food.

In experimental use nonpoisonous dust, the composition of which cannot be published at this time, has also been found to provide perfect protection from insect attack when mixed with wheat seed at the rate of 0.1% by weight. Trouble from the development of insect infestation in packaged seed could doubtless be eliminated by treating the seed with this dust.

Some poisonous dusts are also effective in protecting seed from insect attack, although the desirability of using them is questionable. The possibility of surplus seed being used for animal feeds is a point that should not be ignored. The effect of poisonous dusts on germination should also be determined before they are used.

Corn Storage

When corn is stored on the ear in slatted cribs, winter temperatures reduce insect populations to a point where loss from their attack is inconsequential if the normal procedure is followed of using the corn for feed during the following season. If the corn is shelled after one season's storage on the ear, trouble from insect attack may be expected, unless it is properly handled, since after a year's storage it is invariably infest-

(Continued on page 23a.)

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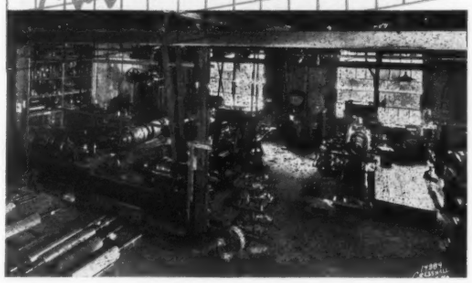

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Chemistry for the Operative Miller

By Dr. C. O. Swanson
Kansas State College

Enzymes: Promoters of Chemical Changes

Editor's Note.—This article by Dr. Swanson, one in his regular series of "Chemistry for Operative Millers," is the first of a group of five articles, all dealing with the general subject of enzymes and their role in the chemistry of wheat and flour. In the succeeding articles the author will draw from the results of his research in enzyme chemistry. Dr. Swanson is professor of milling industry and former head of the department of milling industry at Kansas State College. The Osborne Medal, highest honor award for scientists in the field of cereal chemistry, is included among the many awards and honors that have been bestowed upon Dr. Swanson.

CHEMICAL stability is one of the more important characteristics or properties of wheat and flour. While this stability is not equal to that of some other organic substances like wood, it is sufficient to make storage possible over considerable periods of time. Storage of a large proportion of food products at ordinary temperatures is necessary to civilization. The amount of moisture, as well as the temperature level, are the two most important factors in food storage. Wheat is made stable for storage during the period of desiccation or ripening. Foods like fruits, vegetables and milk which retain large amounts of water lack comparable chemical stability. They must either be used within relatively short periods or they must be preserved by processes of sterilizing, drying or use of low temperatures.

The Purpose of the Seed

The wheat kernel was not made to be milled into flour, but to produce another plant. The designer of the plant world had to solve the problem of continuing life in annual plants under regularly occurring conditions which are destructive to plant cells which have a high moisture content and are most active biologically. The problem was solved by designing the seed. Dry seeds of cereals have a comparatively low moisture content, but they are so organized that the life principle is maintained under conditions which would be destructive to plant cells in their most active state. In the seed the process of living goes on at a slow rate. An increase in either moisture or temperature or both will increase the rate of living. Hence low moistures and temperatures are conducive to the prolongation of viability and also the stability of the substances in the kernel. An increase in moisture and in temperature will shorten the period of viability and also injure the qualities wanted when the seed is used for food.

Main Function of Enzymes

Another problem was to provide means by which chemical processes could take place at temperatures which are not harmful to the structures of the living cells. Two important processes take place in connection with life. First the building of complex stable compounds from relatively simple substances and secondly decomposing these compounds into simple units which can again be used to build other tissues. The former is predominant in plant life and the second in animal life. Enzymes are the means provided for making these transformations possible at temperatures which are neither harmful to the structures of the living cells nor to the products formed. Hundreds of these enzymes are known and their general function is to promote the rate of chemical transformations or reactions. As far as seems to be known, the same classes of enzymes act both in the building up and the tearing down processes. Which way the reaction shall take place depends on the environmental conditions. The functions of the enzymes connected with the tearing down processes have been given the most attention in connection with wheat and flour.

Building of Compounds

During kernel formation, life processes go on at a rapid rate. The kernel is built into a complete structure in the course of a few weeks. During this period considerably more than half of the kernel weight is water. The green leaves and the stems which also have an active part in kernel formation contain much water. This large amount of water gives the mobility necessary for the processes which build the proteins, the carbohydrates, fats and other organic compounds into the kernel structure. The materials used for building are the carbon dioxide of the air, water, nitrogenous and the mineral compounds in the soil. Carbon dioxide furnishes carbon; water furnishes hydrogen and oxygen and the soil furnishes nitrogen and mineral elements. Some oxygen is taken from the air.

Decomposition and Syntheses

The elements in the compounds from the air, water and soil which are used for building the proteins, fats and carbohydrates in the kernels are in a combined condition. The building processes therefore involve first a tearing down of stable compounds in order to liberate the needed elements. After these are liberated, they are synthesized into the stable compounds stored in the seed for the future uses of the new plant. A very vigorous chemical activity must proceed at temperatures and conditions which are not harmful either to the structures of the living cells or to the synthesized compounds. Enzymes make this process possible. At the end of the building process the enzymes are stored in the seed. Provision is also made for the manufacture of more enzymes when the time comes for the construction of the new plant. The seed is therefore loaded. As soon as enough moisture is absorbed by the seed and the temperature is suitable, the process of tearing down the stored products begins. The same enzymes apparently as were active in construction also accomplish the decomposition. Which way the process goes depends on conditions.

The Seed as Source Material

Compounds in the wheat kernel, such as proteins, carbohydrates, fats, together with the mineral elements, were stored to furnish materials for building of tissues in the new plant. Enough of these are present in a mature seed to furnish what the new plant needs until it is developed far enough to obtain the needed materials from the soil, water and the air. The stability of the compounds which makes wheat storage possible, at the same time makes them unavailable for use by the new plant. To be useful to build new tissues the large molecules must be broken down into simpler units. These must be small enough to be transported from the place of storage in the seed to the place where new tissues are built in the roots and leaves of the new plant. The enzymes stored in the seed as well as those manufactured by certain cells are the go-betweens or promoters of these chemical transformations. That these changes can take place at comparatively low temperatures is shown by the fact that growth of wheat starts at 41° F. It is more rapid at higher temperatures since the optimum for wheat is about 70 to 80° F.

Tools of Living Cells

Enzymes are classed as catalysts. The main function of catalysts is to influence the rate of chemical reactions and in doing this they are not consumed. Some amounts may disappear in the process. Therefore a small amount of a catalyst can influence a large amount of chemical reaction. Catalysts are divided into two general classes: inorganic and organic. There are a large number of inorganic catalysts and it may be said that transformations in industrial chemistry are dependent on inorganic catalysts. Enzymes are organic catalysts and are often called biocatalysts. Enzymes are produced by living cells and serve as their tools. They are able to perform their functions at temperatures which are not injurious either to the cell structures or to the substances upon which they act or to the products of the reactions. In the vast transformation by which complex substances are built in plants, the living cells use the enzymes as their tools. Also in the breaking down of these substances as in a seed for building the tissues in a new plant or when plant substances serve to support animal life, the enzymes are the intermediaries. All these changes take place silently and at the comparatively low temperatures favorable for life's processes.

While enzymes are produced by living cells they remain and can act after the cell structure is destroyed. Thus the enzymes in yeast which produce fermentation may be separated from the yeast cells by crushing these and then extracting with water. The extracted enzymes produce the same type of fermentation as the yeast itself. Yeast cells, however, can reproduce themselves but no reproduction of enzymes is possible outside the living cells. Another example of the persistence of enzymes after the structure in which they were produced is destroyed is the enzyme activity in ground wheat or flour. Enzymes also remain for considerable periods in the wheat kernel after life departs. They are left the same as the tools of a mechanic remain after he dies. Enzymes, however, are more than tools since they can act apart from the cells in which they are produced.

Factors Other Than Enzymes

There are several factors besides catalysts or enzymes which influence the rate of chemical reactions. Among those which are of particular importance in the present considerations are: temperature, dispersion in water and physical state or condition. These factors may act in conjunction with catalysts or enzymes. A consideration of these factors will therefore be helpful.

Temperature.—Temperature is one of the more important factors which influence the rate of chemical reactions. When the temperature of such organic substances as paper, wood and coal is raised to the kindling point, the rate of chemical reaction becomes exceedingly rapid. Molecules in substances are in a state of vibration, but at ordinary temperatures this rate is of a low order. For chemical reactions to take place, the rate of vibration must be increased in order that the collisions shall be violent enough to cause decompositions and recombinations. All laboratory workers are familiar with the importance of temperature in facilitating chemical reactions. In the protein determination, sulphuric acid, H_2SO_4, together with inorganic catalysts, is mixed with the ground substance and a high temperature used. This process completely destroys the protein and combines the nitrogen into ammonium sulfate. Without catalysts this process would be slow. The possibilities of rapidity in this method depend on the efficiency contributed by suitable catalysts.

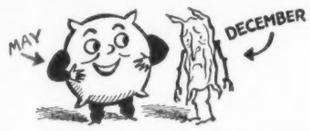
Dispersion in Water.—The presence of water as well as dispersion in water is necessary for a large number of chemical reactions. If some dry crystals of sodium chloride, NaCl, and silver nitrate, $AgNO_3$, are placed close together very little change takes place. If solutions of both are mixed, the formation of insoluble silver chloride, AgCl, takes place very rapidly according to the equations:

$$AgNO_3 + NaCl = AgCl + NaNO_3$$

The $AgNO_3$ molecules ionize into $+Ag$ and $—NO_3$ and the NaCl molecules into $+Na$ and $—Cl$. In water these ions move rapidly and have more chance to make contacts and make recombinations. In a case like

"Whad'ya Know, Brother, About BULK?"

EVERY TECHNICAL man is supposed to know his own field thoroughly and have a general idea of related technical fields. But few food processors have time to develop more than a sketchy knowledge of these related subjects.



Take the bulkiness of salt—the specific gravity—which may vary rather widely. A survey of various salt products from different sections of the country has shown that even salt of the same grade can vary up to 25% in bulkiness over a period of months.

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this, water may be considered as a catalyst. In fact it has been said that water is a universal catalyst since it influences the rate of more chemical reactions than any other substance. Water not only gives mobility to the reacting ions and molecules, but also facilitates the removal of the products of the reactions. As products of a reaction accumulate, the rate is slowed down according to well known chemical principles. All reactions under present consideration which are influenced by enzymes take place in an environment of water.

Physical Condition.—Physical condition such as fineness of division influences the rate of reaction. Dispersing or dissolving in water is one of the most effective ways of dividing a body into small particles or molecules. For such subdivision mechanical pulverization is an aid. This increases the extent of surface and hence is an aid in the solvent action of water. Enzymes must make contacts with the reacting substances and for this a large extent of surface helps. The gelatinization of starch is a conspicuous example of the influence of physical condition. When starch is boiled in water, the granules swell to many times their original size. If such swollen granules are exposed to the enzymes which convert starch to maltose, both the rate and the amount of sugar production will be greatly increased. Mechanical injury of starch granules in commercial milling makes the starch more susceptible to attack and hence the rate of transformations influenced by enzymes is accelerated.

Enzymes and Inorganic Catalysts

As a rule enzymes are more specific than inorganic catalysts. That is, a certain enzyme will act only on one kind of substance known as its substrate. Thus certain enzymes act on starches, others on proteins, and still others on fats. Those which act on starch have no influence on proteins or fats, and enzymes which act on those substances have no influence on starch. A good example of the more general action of inorganic catalysts is shown in the commercial production of glucose from starch. The starch is first suspended in a large amount of water, then the acid, usually sulfuric, is added and the whole heated with steam under pressure. This hydrolyzes the starch and the acid catalyzes the chemical reaction which produces the commercial glucose which also contains maltose and dextrins. In this instance the temperature must not be so high as to be destructive to the products. Hydrochloric acid can be used as well as the sulfuric. The main function of the acid is to furnish an abundance of hydrogen ions, +H, which are the catalytic agents. The presence of such ions is also of great influence on reactions influenced by enzymes.

♦ ♦

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A Preliminary Report

Effectiveness of DDT in Flour Mills

By W. J. Davis

IT is by the use of the new insecticide DDT that we hope to be able to combat insects that breed in idle machinery, seldom used spouts, heads and boots of elevators, dead-ends of conveyors and many other hard-to-get-at places in flour mills.

Many interesting articles have appeared in the newspapers and trade journals describing the discovery and potential uses of DDT. Stories of its use by our armed forces, which now receive the entire production of the chemical, in reducing the insect life on tropical islands and in areas threatened with the louse-borne plague are proof of its efficacy.

Although DDT will not be available until after the war, it does possess potentialities that are worthy of investigation. We have conducted a series of experiments to determine its effectiveness on the confused flour beetle (tribolium confusum), the insect most commonly found in flour mills.

Our first tests consisted of preparing a 5% solution of DDT in an organic solvent which was used as a direct contact spray. It was applied by a hand spray to a box approximately 18 inches square in which had been placed 100 adult weevils on a thin scattering of flour.

The speed of its action against the weevils was rather amazing, for within five minutes the entire lot was either dead or competely incapacitated. Additional tests were conducted 24 hours later in the same box. Another group of 100 weevils was introduced and a glass cover placed over the box so as to observe the reaction. The effective residual kill retained by the original application of DDT spray soon showed its lethal effect on the second group of weevils.

Another box of similar size was sprayed with 5% DDT solution on its unpainted surface and allowed to stand 30 days before introducing a new group of 100 weevils. It required approximately 24 hours for this lot of insects to succumb. Other tests have since shown the effectiveness in killing weevil is still retained after three months.

One peculiar fact was brought to light while conducting these tests and that concerned the comparative immunity of the beetle while it was in the larval or pupal stage. Repeated tests showed that approximately 50% of the larvae were transformed into the pupal stage and then into the adult weevil stage before being killed. Ultimate destruction of the entire lot was obtained, however.

The fact that the beetles were not destroyed until in the adult stage of the life cycle demonstrates that DDT is effective only as a contact insecticide, and that it does not have the ability to bring about an effective kill when the beetle is in the egg, larval or pupal stage of its life cycle. This fact indicates that DDT will not replace fumigants that do attack insects, regardless of the stage of the life cycle.

With the information obtained from our experiments conducted in the laboratory, and with the further knowledge that DDT is said to be toxic to humans if taken internally, we proceeded to spray a protected spot under a hoppered bin where infestation was known to accumulate. The rapidity with which the weevils succumbed to the DDT was remarkable. The spot was then swept and cleaned and another application of

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Does the newly developed insecticide, DDT (dichlorodiphenyl-trichloroethane) have possibilities for use in control of flour mill insect infestation?

W. J. Davis, chief chemist, Standard Milling Co., Buffalo, N. Y., recently conducted some preliminary research on that question. While there is much to be learned regarding the uses and limitations of DDT, his report indicates that it has much promise as a supplementary insecticide and probably will be used, with general and spot fumigations and mechanical and electrical devices for the elimination or control of insect infestation in flour mills.

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Better results in the home kitchen is a key to sales success of flour in retail stores. Women remember the brand that brings them "good luck" and buy it again and again.

Monsanto XC Calcium Phosphate helps make first sales, too, for it contains enough healthful, bone-building calcium to meet government standards to permit you to label your brand "calcium enriched." And women, conscious of nutritional values, look for enirchment information on labels!

Although Monsanto XC Calcium Phosphate is *extra rich* in calcium, it costs no more than ordinary phosphates. It is easy to apply, since it may be added to the flour stream with standard feeding equipment or in batch mixers used for self-rising flours.

Made from the finest food-grade lime and Monsanto phosphoric acid of 99.9% purity, Monsanto XC Calcium Phosphate is high in quality . . . high in purity.

The day is coming, forecasters say, when *all* flours will be enriched. Why not get in at the head of the parade? We shall be pleased to send you information on flour enrichment with Monsanto XC Calcium Phosphate, and, if you wish, give you a sample of our product. The coupon is for your convenience. MONSANTO CHEMICAL COMPANY, Phosphate Division, 1700 South Second Street, St. Louis 4, Missouri. District offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

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DDT was made to the outside walls and flooring around the bin hopper. Periodic examinations of this place revealed the excellent protection obtained. The flour that accumulated under the bin ceased to be a lodging or breeding spot for the insects.

With this one example cited as a method of controlling the confused flour beetle in flour mills, it shows the way for reducing infestation in numerous other places that have been mentioned.

When DDT is finally made available after the war, the chemical should contribute much to control of insect infestation in flour mills. It is evident that although much remains to be learned about DDT, we believe there will be a definite place for its use, with general fumigation, spot fumigation and with the use of mechanical devices, in controlling infestation.

Acknowledgment is made to the Monsanto Chemical Co. for supplying a sample of the chemical for use in these experiments.

——BREAD IS THE STAFF OF LIFE——

"Flour Milling Technology" in New Edition

A REVISED edition of "Flour Milling Technology" by Leslie Smith —a standard text and reference book for English millers—is now on sale. It is published by the Northern Publishing Co., Ltd., 37 Victoria Street, Liverpool, England, and is obtainable from that firm for $4.25. It also is obtainable from the publisher's agent in the United States, J. D. Broomhall, "Corn Trade News," 230 Produce Exchange, New York, N. Y., for $5, which includes import duty, exchange and postage.

The new edition is the third edition of the book which was published originally in two volumes. The second edition stocks were destroyed by enemy action in 1941. The new edition is in one volume and has been revised and enlarged. It consists of approximately 600 pages, and contains 200 illustrations, the majority of which are illustrations of flour milling machinery and flow diagrams.

The author has devoted the greater part of his career to the technical side of flour milling. He was born in 1893 and served his apprenticeship in flour milling at Gloucester, England, with J. Reynolds & Co., Ltd. He served in the British army during World War I and after the war was made assistant manager of the Premier Mills, London, of Ranks, Ltd., and was transferred to Cardiff in 1921 where he started classes in flour milling.

Mr. Smith later conducted the first National Correspondence Course, published by the National Joint Industrial Council for the Flour Milling Industry in conjunction with Milling, a British business journal. He eventually became one of the examiners of the flour milling classes under the City and Guilds of London Institute, a position which he has held for the past ten years.

For some years he has been associated with Thomas Robinson & Son, Ltd., flour milling engineers, Rochdale, Lancashire, England, as technical director and at the present time holds the wartime appointment of controller of Re-Commissioned Mills, Ltd.

The latest edition of the book is divided into two sections with appendices. The first section is concerned with flour milling and consists of 44 chapters. The first four chapters relate to wheat—its structure and physical characteristics, its impurities, its diseases, details of wheat growing countries. The next 12 chapters deal with the preparation of wheat for milling; the following 10 with modern flour milling, with one chapter on early methods of grinding and the development of the modern milling system. Then comes instruction on warehouse equipment and on flour improving and bleaching, on the duties of mill foremen, on the design of flow-sheets, on types of wheat and their bread-making qualities, the art of wheat blending, calculation of flour extraction, manufacture of specialties, such as wheatmeal, self-rising flour, biscuit flour, etc., choice of site for mill, insurance, layout of mill premises and mill design.

The second section—Science—consists of 18 chapters, dealing with machine drawing, properties of matter, specific gravity, flotation, pressure in liquids, elementary heat, elementary mechanics, transmission of power, force, elementary study of steam plants, measurement of power, constituents of air, elementary principles of breadmaking, moisture testing, etc. The appendices include a layout of machinery in a mill, rules for millwrights and a wheat seeding and harvesting calendar.

——BREAD IS THE STAFF OF LIFE——

If your plant maintenance man thinks that lamps of sufficient size in every socket in the plant are expensive luxuries, that just run up the power bill, you might suggest that he inquire about hospital rates and accident compensation and physicians' fees incurred by sprained ankles, falls, etc. Safety devices do not cost nearly as much as funerals, either.

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Milling 60 Years Ago

Break Rolls and Middlings Production

By Louis H. Gibson

Editor's Note.—The following article is reprinted from "Gradual Reduction Milling," written by Mr. Gibson and published by The Northwestern Miller in 1885. The author was a recognized authority in milling technology and his book was written shortly after the introduction of the gradual reduction system of roller milling into this country. Keeping in mind the fact that Mr. Gibson wrote his book 60 years ago, millers today will find that the basic principles emphasized by the author at that time have not changed.

AFTER the stock leaves the first break scalper it frequently goes through an aspirator on its way to the second break machine. These aspirators are constructed like the aspirating middlings purifier, though they do not need to be so fine in adjustment. This machine may take out a little light bran, though very little, not much of it being detached during the first reduction. But if there should be any wheat which had not been separated from the heads or chaff in threshing, the first reduction will complete this work, and the aspirator will draw out the white caps. But really there is not a great work for the first break aspirator to do, the reduction not being severe enough to detach any of the impurities of the wheat which would not go through the scalper.

The second break operation is a middlings making as well as a preparatory process. Very little flour is made by the rolls on either the first or second breaks. More flour is made in the reels and elevators than on the rolls. This matter is deserving of careful attention. As a middlings making process, every detail of gradual reduction should have in mind not only the making of middlings, but the means of preventing the making of break flour during the process of wheat reduction. As there is no difficulty in making the flour and middlings separation from the second break stock, it cannot be seen why a sieve separation would not be possible. The position for such sieves might be under the rolls, to avoid the use of elevators, and hence little flour is made in this way.

Considerable has been said about the second break and its importance as a milling operation, not exactly on account of its value in its production of middlings or flour, but in a preparatory way in getting the stock ready for the third and fourth breaks. Because the results of the second break are not apparent during the immediate course of, or in connection with its operation, it is not deserving of neglect. It is a matter of the greatest importance that the grinding by the second break rolls be attended with great care, as the whole product of a mill is largely influenced thereby.

We often see tables wherein the exact proportions of flour and middlings made by the various breaks are given with the strictest regard to accuracy of expression. Figures are given, including two and three decimal points, indicating that the weighing and measuring has been done in a very scientific manner. Excepting in general terms and in a general way, the writer has never been able to determine the quantities of flour made by the various breaks. He has never done any weighing or measuring for the purpose of informing himself, and cannot think that the figures which we see given for the purpose of determining the quantities of flour made in this way can be of practical service, as there must be a great deal of variation with the different kinds of wheat, and with the same wheat under different conditions and circumstances. In one mill the break stock may drop into a conveyor and be carried some distance before entering an elevator that conveys it to a scalping reel, which may be somewhat longer than necessary. The conveyor, its length, the elevator, the spouts leading therefrom, the reel and its construction, may be largely instrumental in influencing the proportion of flour made by the breaks. Thus a miller may be doing just as good work on the rolls, independent of other devices, and yet if he were to take the pains to determine how much break flour he was getting through the reels from a certain

Kitchen, courtesy of Consolidated Edison Co.

WILL THE THOUSANDS of housewives who turned to commercially baked bread during the past few years go back to home baking as they give up their jobs in war plants?

The answer will hinge to a great degree upon whether the word "ENRICHED" is featured on your sacks and packages of family flour.

For during the period since January, 1943 when War Food Order No. 1 made enrichment of bakers' white bread and rolls mandatory, the public has learned to appreciate that the word "ENRICHED" means higher value, will in fact insist upon seeing it when buying either bread or flour after wartime regulations are rescinded.

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break, it would be shown that he was not doing satisfactory work, when compared with the standard set forth under more favorable conditions. The proportion of grinding surface on the rolls, their speed, the dress, all largely influence the proportion of flour made; and as there is such a great variation in all these things, and as millers are operating under such a variety of conditions, it is difficult to see how they can be greatly benefited by the elaborate exhibitions which are the result of ideal conditions, and which are expressed in a very scientific way.

Any one who has ever done any sifting for the purpose of making experiments, knows how deceitful that process is. He knows that he can always get better results with a hand sieve than he can get with the reels in his mill in a practical way. Take the sixth break, for instance. By sifting the stock one can get some very brilliant flour, yet as it comes from the reel it is far from brilliant. It may be white enough from winter wheat, in the dust, but it is very red in the dough. In sifting the second break one finds very little flour, and that of questionable quality. The flour from the second break does not look as well as that from the fifth. The middlings, however, are of good quality, both as to general appearance and form.

Some time since, the writer made up his mind that 10 corrugations to the inch was the proper thing for the second break, and having used both 10 and 12, he is still persuaded that the former is the best. Such a corrugation cannot make a great deal of flour, no matter how close the grinding; and whereas, it is not desirable to grind close on this break, there are circumstances which demand closer work one time than another, both in the first and second breaks. This is when the wheat is soft. The first break is more of a purification than the following wheat breaks. The second break makes large, heavy middlings, and a small proportion of flour. The grinding on these two breaks has a great deal to do in influencing the quality of the work done on the subsequent breaks. When the wheat is soft, intimated before, it requires that the grinding be closer in order that the third, fourth and fifth breaks may not have so much to do that they will make soft, flat middlings.

The scalping reel for the second break should be one third longer than that for the first. An eight-foot reel will do the work on a 500-bbl mill. Three or four feet will do for a 100-bbl mill. The length of the scalping reel for any break is dependent upon the proportion of soft stock going into that reel, and for a mill with four breaks which makes 100 bbls of flour per day, as is often the case, longer scalpers would be required than are here specified. Owing to the greater amount of work required of each reduction, and consequently the larger proportion of flour stock made, a larger reel would be necessary. It is quite common to build scalping reels all in one chest, and consequently all of one length. There cannot be good reason for this, as a reel which would be long enough for the third or fourth break would be too long for the second and not long enough for the fifth or sixth. Or, if they were long enough for these breaks, they would be too long for the others, and as has been said before, it is nearly as important that the scalping reels after the first break should not be too long as that they should be long enough. If too long, they would whip through fine bran and other impurities as the tail, besides making flour in the reel.

As a 10-corrugation stand of rolls will make a good many 000 middlings, and as 000 middlings from the second break are bright, if of good quality, it suggests the clothing of that scalping reel with No. 20 wire cloth, which was the same as used for the first. One might say that if a second break with 10 corrugations requires a No. 20 wire cloth on the scalping reel, the eight or coarser corrugations of the first would demand coarser than 20 wire for the first break. It would if coarser middlings than the 000 were desirable in the mill. The 0000 middlings, which would be equivalent to those of an 18-wire, have large

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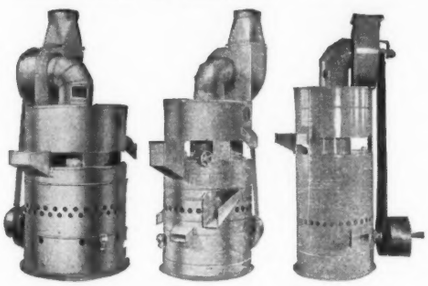

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adhering portions of bran, and are not of a quality readily disposed of in the manner usual with middlings.

No. 20 wire was used for the first break on this account, but if the natural demand of the corrugation had been considered, without reference to the quality of the middlings, 18 wire would have taken its place. No. 20 wire is the natural demand of 10 corrugations, and as the product of middlings from that number is desirable, it is so clothed. The product of the second break is bright, clean stock when the preceding first break has been run sufficiently close.

Two or three years ago, when the stock from the various breaks was under discussion, a miller was advised to bolt his third and fourth break chop together after leaving the scalper, and the second and fifth by themselves. This was in a large mill, where it was possible to do this if there was any advantage to be gained by such an arrangement. This was not right. If there are to be any divisions at all of this kind, as there may profitably be in a large mill, it does not want to be done by running the second and fifth break stocks together. As a matter of fact, there are no two breaks which are alike. The third and fourth are the nearest, but the others are widely different one from the other. It would be better policy to handle the second and third break together than it would the second and fifth. But the second, third and fourth are near enough alike to be handled together in separating the flour and in the purification of the middlings. This part of the description will be handled later. The flour from the second break is white and granular. It has a rounder, sharper feeling than that of any other break.

The stock passing over the tail of the second break scalper goes to the third break, of course. In some instances it passes through an aspirator. The idea of an aspirator is to take out the light, fine stock and thin, fly-wing bran which may be detached during the process of reduction. In the later reduction there may be some finished bran to be taken out, which, if continued to the end, would be cut up and thus be injurious to the flour made by these machines. In fact, this would be the case in the reduction of any of the impurities which were specified as being such as it was desirous of taking out by the aspirators.

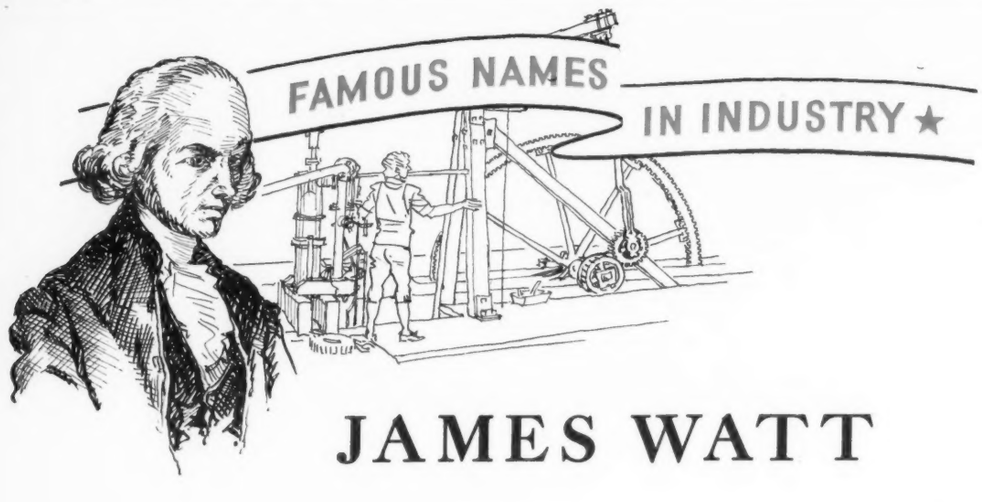
These machines are nothing more or less than purifiers. They take out the impurities which are of less gravity than the unfinished break stock. They remove the stock which should not go in with the subsequent breaks. They take out unfinished feed which would otherwise be pulverized with the flour.

But there is another side to this question; at the same time that they take out these impurities they draw out flour and mix it with the undesirable stock, or blow it into the dust room. One might say that there should not be flour in the stock which tails over the scalpers to go to the aspirators. But the fact of the stock showing clean as it leaves these reels does not necessarily imply that it does not contain flour in a shape to be taken out by the spirators. The unfinished break stock may have this flour enclosed in the various particles composing that stock, and which was not disturbed or knocked out in the reels, but when submitted to the action of a suction fan, will come out in surprisingly large quantities.

Here again comes the query whether or not the dismembrator or agitator does not mix a dangerous proportion of the impurities of the wheat with the flour and middlings stock. As opposing the idea of a dismembrator or even the action of a reel, is the sieve scalper, which is certainly the gentlest means of making a separation.

A miller with whom the writer was talking several months ago, said that he never changed the feed gates on the second reduction, as he changed it on the others to conform with this. His idea in so doing was that, by such a plan, he was enabled to keep a uniform feed on the mill, by sizing the wheat on the first break. The writer does not believe that this result would be accomplished in this way; and, in the second place, does not think it desirable to try to do it. The uniformity of the feed on the second break machines would be dependent upon the uniformity of the grinding upon the first, and it is not desirable that the grinding should be uniform on the first break. Certain conditions of the wheat demand closer grinding, and certain other conditions demand relatively higher grinding. To make the grinding on the first break conform to the set of the feed gates on the second break rolls, is going out of the way to accomplish something that is not desirable even if it were attainable. One does not want a uniform feed on the mill. There are certain times when it should be relatively light, and certain other times when it should be heavier. For instance, with soft wheat it may be desirable to run a light feed and with hard wheat a heavy one. The tail end of the mill will prompt as quickly as anything in this matter.

This miller said that closer grinding on the first break would naturally reduce the feed on the second, and consequently demand that feed be taken off the first break machines, and in this way compensate for the



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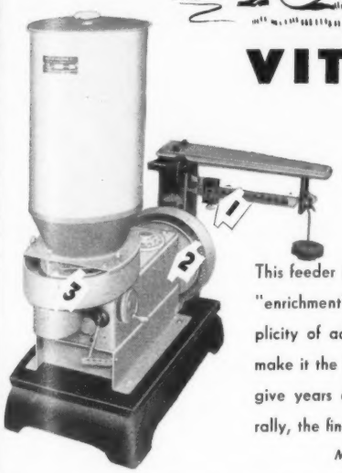

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effects desired, because of hard or soft wheat. With this view of the case it is presumed that the low grinding on the first break, because of the wheat being soft, would reduce the feed on the mill enough to make the bolting all right because of the stock being softer; that is, the demand for low grinding at the head of the mill would cut down the feed enough to compensate for the demands of a light feed further on in the processes of separation.

But this sounds and looks altogether too nice to work out. It is these acute, elegant ideas that are liable to lead people astray. There would be more frequent changes under these circumstances on the first break, and less radical changes of the feed on the breaks following the second. The closeness of the grinding, as said before, would make a lighter feed all the way through, and as such grinding would be demanded on the first break by soft wheat, this diminution of the volume of stock would presumably make relatively closer grinding where least desired with this kind of wheat; that is, on the breaks following the second. On the whole, it does not appear profitable to follow arbitrary rules in regard to these matters.

Planning Now for Postwar Employment

THE first major problem to confront us following the conclusion of the war will be the demobilization of almost 11,000,000 men in the armed services. What procedure will be followed and how rapidly these men may enter the civilian economy will depend upon decisions that are made at the time the peace is concluded. The provisions of the Selective Service Law respecting reinstatement of men discharged from the armed services to their former employment are well known. Presumably, many of these men will want to return to their old jobs. This law, however, does not take account of the thousands of men who were inducted into the military service from strictly wartime jobs which will be nonexistent at the conclusion of hostilities and the many thousands more who were enlisted in the services who had never been gainfully employed. In many cases, even though reinstatement is possible, it may not be desirable. Many returning soldiers will have far different skills, abilities and desires when they come back from the war than when they left civilian life. Some of them may no longer be able to perform their previous duties. Many returning servicemen, moreover, were in blind alley jobs or were never trained for any occupation when they joined the forces.

The provision of the GI Bill of Rights will do a great deal toward enabling the veteran of this war to make a satisfactory employment adjustment. Many of these men will take advantage of the provisions which enable them to borrow money for the purchase of a farm or a small business. A great many more will be interested in improving their education and training. Naturally, the more education and training they have the better workers they will be in their chosen employment field. The important thing is that there shall be enough and suitable training and retraining facilities; that there shall be enough good vocational guidance officers to direct the men and women towards the most appropriate types of education and training; and to pay high enough wages and allowances during training so that those who need it will be able and willing to take it. We believe that the provisions of the GI Bill are adequate to take care of the serviceman who is eligible and who wants the training.

The first need in planning for an orderly demobilization of men and women from the forces is for as much information as possible about their education, occupational background and skills and their present work qualifications. The military services have taken at least one step in this direction by providing personnel records on all enlisted personnel. However, these records are not available to those responsible for employment planning until the time of discharge. The Army and Navy have developed "conversion tables." These were compiled by the Employment Service analysts who made the country's occupational dictionary—a careful analysis of jobs and the skills required to do them. In the first column of the conversion tables is the Army or Navy job; in the second, comparable jobs in civil life that could be done by a serviceman who had been in the job while in the forces; in the third, any additional training required; in the fourth, the physical

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condition needed for good performance in that job.

A second essential for orderly demobilization is efficient machinery. Our Selective Service System is well set up for that purpose. To be most effective, this demobilization machinery should be closely linked with the central Employment Service and the GI Bill specifically provides that the United States Employment Service, with its 1,500 offices throughout the country, is to have the responsibility of assisting war veterans to find suitable jobs. The Employment Service should be largely responsible for insuring that plans for the rate and order of demobilization are linked with the absorptive capacity of industry, agriculture, the professions and training agencies of all kinds, and with general re-employment plans for the transition period.

Workers now employed in wartime industries will have to be transferred back to the pattern of peacetime employment. Moving people from the occupations of war to the occupations of peace may not differ very much from the process of moving them into war work. We have learned a great deal about what to do and what not to do in order to make the shift from war work to peace work in an orderly and efficient way. Equally important, the employment machinery has been built up which will have to handle the huge transfer job.

Among other things, in order to effect this transfer we must have a complete survey of war industries, of the peacetime uses of war plants, of how war has changed the industrial structure of each area and how peace will affect it. We will need information regarding cut-backs and reconversion plans and we will have to have complete information about war workers; what they were doing before the war; what they are doing and can do now; and what they would like to do when the war is over. Our general goal should be to organize a rapid and orderly conversion of industry. The more specific goal, as far as employment is concerned, is to avoid a mad scramble for jobs, to keep unemployment to a minimum and to help displaced workers to find their way into the most suitable employment as quickly as possible.

The central pivot of employment organization is and will be the Employment Service. Around it are grouped all the other agencies dealing with questions of labor supply and training. In the transfer of war work to peace work it will have to play a place of first importance. If the Service is given advance notice of mass lay-offs, for example, it can set its own machinery in motion where necessary to start mobilizing community resources in order to prevent workers being thrown on the employment market before plans are made to employ them or assist them during the lay-off period. The Employment Office can register workers and can be on the alert to uncover opportunities for temporary employment that might be suitable either in private undertakings or on public works of one kind or another. —From an address by John H. Thomas, War Manpower Commission, presented at a meeting of District 9, Association of Operative Millers.

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Many of the feed supplements formerly used as Riboflavin sources are now in short supply, but fortunately ample amounts of the pure crystalline vitamin are available. But what is of even greater importance — simple arithmetic will show that the pure Riboflavin is by far the cheapest source of this vitamin.

Chas. Pfizer & Co. Inc. offer for feed supplementation pure crystalline Riboflavin U.S.P. (1,000,000 gamma or micrograms per gram), Riboflavin Mixture No. 2, and Riboflavin Mixture No. 3. The two latter consist of intimate mixtures of the crystalline vitamin with calcium carbonate or edible starch, calcium carbonate being used as the base for Mixture No. 2 and edible starch for Mixture No. 3; both contain 1 gram (1,000,000 gamma or micrograms) of Riboflavin per ounce. Shipment of any of these products can be made at once on receipt of order — no application to the War Production Board for allocation is necessary.

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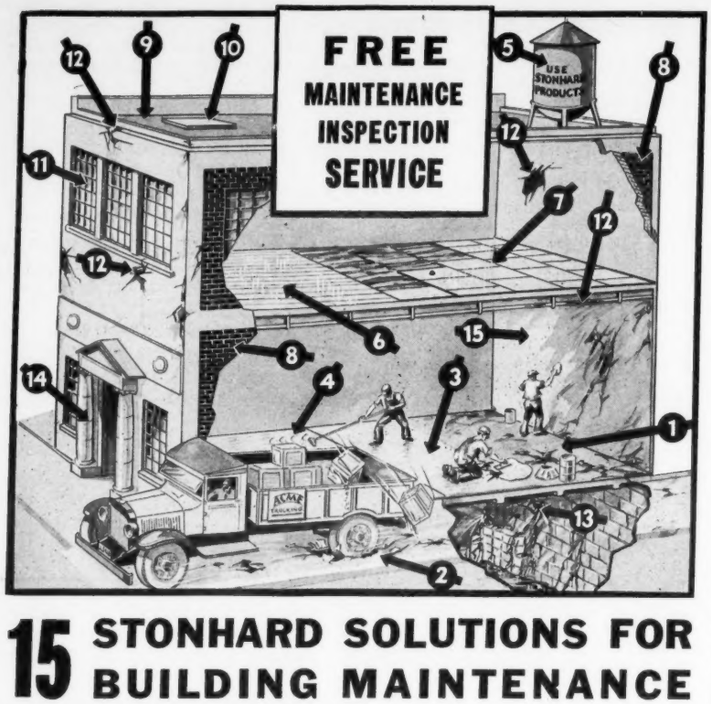

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Revision of Grading Standards Needed

By DR. JOHN H. PARKER
Kansas Wheat Improvement Assn.

REVISIONS in the federal grades for wheat are long overdue. The present grading standards give undue emphasis to test weight and do not tell the miller what he needs to know about the milling and baking qualities of the wheat being graded.

Such revisions, when made, should give some attention to the variety of wheat, segregating the poor quality varieties from the varieties that are desirable from the millers' and bakers' viewpoints.

Two new wheat varieties, Pawnee and Comanche, are now coming into production in Kansas. Pawnee is adapted to the central section of the state, and Comanche is more suitable for production in the western part of the state.

Pawnee is a cross between Tenmarq and Kawvale. It produces high yields of grain having a test weight of about two pounds per bushel heavier than Tenmarq. Comanche is a cross between Tenmarq and Oro, a Turkey type selection made at the Moro, Oregon, experiment station.

Most of the 1945 crop of these varieties will be and should be used for seed to be planted this fall for harvest in 1946, when millers can begin grinding these two new varieties which yield more than Tenmarq and which are vastly superior to Chiefkan and Red Chief in baking quality.

A third new variety, Wichita, is a cross between Early Blackhull and Tenmarq. This early ripening variety is a great improvement over Early Blackhull, and is expected to replace that poor quality variety. There will not be much Wichita wheat available for milling until 1947, as most of the 1945 and 1946 crops will be used for seed in increasing the acreage of the variety.

During the next three years, while Pawnee, Comanche and Wichita wheats are coming into production, millers can protect the quality of their flour by paying careful attention to the origin of the wheat purchased. The Kansas Wheat Improvement Association has issued maps which show the areas in which the different wheats are grown. Most samples of Chiefkan and Red Chief can be fairly readily identified by their dark color, hard texture and heavy test weight, as well as by certain kernel characteristics.

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Pass It Along

KEEPING workers "in the dark" as to what your department or the company is trying to accomplish, does not make for intelligent teamwork. Workers will take much more interest in their individual tasks if they know and understand what is ahead of them. This broadening of the understanding of each worker is one of the training responsibilities of the supervisor.

It is not enough to instruct the worker in the details of his own specific operation. If he knows the importance of the part his job plays, he will be much more interested, and will be a more co-operative employee.

The Company's Goals

Every company has certain production goals, quality goals, waste reduction goals, work improvement goals and safety goals. It has certain results it is trying to achieve. The more that supervisors do to pass on to workers an understanding of what the company "is shooting at," the more likely workers are to co-operate in accomplishing the desired results.

It is small wonder if workers become indifferent when they do not have information as to what is expected of them—if they don't know what their share of the task really is.

Insofar as a supervisor is informed regarding company goals, he should endeavor to pass on such information to his workers so they have an equal understanding. This part of the worker's training is important.

Reasons Behind Policy

It is not enough for supervisors merely to pass on to workers a mere statement of company policies. They should go further and give workers an understanding of the reasons behind company policies.

When the reasons are not understood, policies may seem to be unnecessary interference and restrictions of workers' freedom on the job. Disciplinary regulations will be irritating unless good reasons for such regulations are presented.

One of the most essential steps in selling a company policy to workers is to give them full reasons behind the policy.

An understanding and knowledge of the product or service a company produces is essential information which each worker should possess. Supervisors should include such information in their program of training and instructing their workers.

It is a part of each supervisor's function to keep information flowing to his workers. He should keep workers up-to-date on new developments in company policies, schedules, plans, and projects. Insofar as the supervisor is informed as to the company's postwar plans, this information should be passed along. This is an important feature of worker training today.

This educating of workers on company policies, programs and goals is a continual function of supervision. New information is constantly coming to the attention of supervisors. Just as continually supervisors should pass this information along.

The whole attitude of workers will be different when they are kept informed. They want to know what is ahead. They want to know about changes which may affect them and their jobs. They will work more co-operatively when they have a broad understanding of their jobs and information related to their jobs.—"Management Information." Elliott Service Co.

Susceptibility of Flour

(Continued from page 3a.)

flour. In a given period of time, however, the flour beetle produces many more progeny in enriched bakers flour than in nonenriched flour. This increase in reproduction is due to the addition of riboflavin.

It may be concluded, therefore, that insect control constitutes a more serious problem in the storage of flour enriched with riboflavin than in that of nonenriched flour.

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Protection of Grain

(Continued from page 11a.)

ed to a greater or less extent by a large variety of insects. After shelling it should be carefully cleaned, before storing. Several types of available cleaning equipment are capable of removing a majority of insects and reducing the cracked corn and foreign materials to less than one half of 1%. By the proper use of loading machinery, breakage of the kernels can be held to a minimum. This is important, since, as previously stated, bran beetles, which are most troublesome in corn, do not breed readily in clean, unbroken grain.

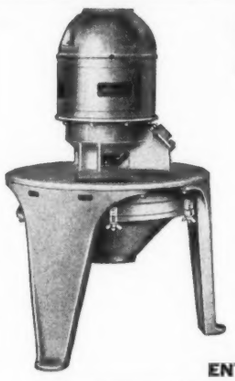
Steel storage bins are best for storage of shelled corn, as they are economical, well adapted for fumigation, and, if properly constructed, will keep the grain dry. A capacity of from 2,000 to 3,000 bus constitutes a convenient size. In such bins corn cools during the winter to temperatures below the level of insect activity, and such is the insulating value of the corn that temperature changes in the center of the bins are slight throughout the year. Temperature changes in various parts of a 2,000-bu bin of corn in Iowa are shown in figure 1-I. It may be noted that grain temperatures at the floor and at mid-height remained below the danger point throughout the year and only the surface and outside layers of corn became warm enough to support active breeding of insects.

Insects migrate to bins of grain in large numbers during the summer, but the establishment of colonies in the surface grain can be prevented by spraying the surface with oil at the rate of 2 quarts for each 1,000 bus of corn. The oil should be either technical white or other refined oil of 100 to 200 seconds viscosity (Saybolt, 100°F.) and be free from objectionable odor.

Insects occasionally become established in bins of shelled corn and by their activities create moisture and temperature conditions that are abnormal and, if unchecked, will cause grain spoilage. On the approach of cold weather, shelled corn that is heating, owing to the presence of insect infestations, suffers deterioration of the surface layer. Water vapor from the hot grain in the bin moves upward and condenses on the colder surface grain. Rotting and spoilage of this surface grain may then occur, although the damage does not appear to extend very far below the surface.

Fumigation of infested shelled corn in bins will satisfactorily control insect infestations, and dosages have been established for all common fumigants. These dosages are listed in table 1, together with those suitable for wheat.

In the South, where field infestation is common and winter temperatures do not check insect activity, the problem of corn storage is much



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greater. As soon as corn is dry enough to be safely stored it should be placed in cribs suitable for fumigation, and treated at once and as often thereafter as necessary.

Preservation of Dried Processed Food

In the preservation of dried processed foods from insect damage the two most important requirements are the manufacture of an insect-free product and the use of an insect-proof package.

A general fumigation of mills and other dry-food processing plants with hydrocyanic acid, methyl bromide, or chloropicrin from one to three times a year, supplemented with local fumigation every month of all machinery in which milled stock accumulates, will keep the insect population at a low level and facilitate the production of an insect-free product. By the judicious use of high-speed sifters or centrifugal force machines, milled products of fine granulation can be rendered free from insect life. Coarser products can be treated by centrifugal force, heat sterilization, or fumigation. Centrifugal force is being used extensively and successfully for the treatment of such products as flour, meal, grits, semolina, corn meal, powdered soups, wheat germ, feeds, dehydrated foods, etc.

Individual package fumigation with some of the formates is being practiced to some extent. Methyl formate was originally used to treat packages of dried fruit, 5 to 9 cubic centimeters being injected into paper bags that were then filled with 25 lbs of dried fruit. Isopropyl formate is now being used extensively for this purpose in California and is also being used to treat packages of pea soup stock. One cubic centimeter is injected into a Kraft paper bag holding 5 lbs of material. The bag is then heat-sealed in two cellophane bags. If packages are tight enough to retain the vapors, the odors of the formates are also retained for some time. These odors are not objectionable with most commodities and usually disappear.

Insect-Proof Bags

Dried processed foods are packaged in a miscellaneous variety of bags and cartons. Fabric bags, which are used extensively for packaging flour and other milled cereal products, do not protect from infestations by insects. Small forms readily crawl through the meshes and adult insects thrust their ovipositors through the fabric and lay their eggs in the material contained in the bags.

Paper bags afford considerable protection from outside infestation if they are properly made and sealed. With the exception of the cadelle, Tenebroides mauritanicus (L.), and the lesser grain borer, a majority of the insect pests of dry processed foods have difficulty in cutting their way through the walls of substantial paper bags. Many of them can and do, however, enter through the needle

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PERMAFLUX magnets are powerful, and stay that way. As an example, it requires a pull of 16 lbs. to release a 1 inch diameter round steel ball adhering to magnetic face.

PERMAFLUX pays dividends by eliminating hazards of explosions and fire due to tramp metal. In addition, savings are realized in costs of damage to machinery and labor time lost in maintenance and repair.

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In Addition to Standard Containers We Offer Premium Packages with Sales Appeal.

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holes whenever bags are sewed, unless the holes are protected in some way. All seams of paper bags should be cemented, and sewed tops and bottoms should be protected by strips of gummed tape or other covering. Cartons sealed and covered with a wet wrap that completely covers the closure are the best type for excluding insects. The cadelle, however, is capable of cutting through even a metal-foil-wrapped carton.

It seems probable that insect repellent chemicals may aid materially in solving the problem of keeping insects out of susceptible products. These chemical repellents may be used to impregnate one of the plies of multiwall paper bags, the coating liquor used to prepare coated Kraft paper, or the paper used to make single-wall bags. Weak solutions of DDT, nicotine sulfate and potassium chromate have exhibited excellent protective properties when used experimentally as described above.

Moisture Apparatus

A GOVERNMENT scientist has invented a moisture apparatus which, in making moisture tests, will completely remove all "free moisture" from flour, cereal products and like materials without damaging other ingredients.

The new apparatus, operated by the use of high frequency electric current, makes it possible to remove varying amounts of moisture simultaneously from several samples of material. It also permits a quicker determination of moisture content than is possible by present official methods.

Alfred Christie, chief of the testing section, Office of Distribution, War Food Administration, is the inventor of the apparatus. It is his second invention since 1940, the first being a power unit used on electric moisture meters which determines the amount of moisture in whole grain. The Department of Agriculture has approximately 300 of them in operation, while some 700 more are in use in private industry.

Mr. Christie's newest invention applies the heat from the center of the sample outward and drives the moisture out. As the moisture is driven out, the temperature decreases. Hence when all the moisture has been removed, the sample is sufficiently cooled to be weighed immediately.

The apparatus will be used as soon as equipment in suitable form is available.

Wartime Milling

(Continued from page 7a.)

overcome by feeding the wheat into the rinsing worm just below the water level so that it receives a momentary immersion only. Even so, the pick up will be from 1½ to 2% of moisture. A disadvantage of this method is that serious variations in the amount of moisture picked up are caused by the state of cleanliness of the rinsing worm covers. After working for a short period, the slotted covers become coated with a film of slime which results in water being carried up in the inclined worm some distance above the level of the water in the washer tank. This can cause variations in the moisture content of the wheat leaving the whizzer of as much as 1%.

Control of Mill

Comparative regularity in the actual milling process can only be obtained by constant effort on the part of all concerned. Unfortunately, it is not a state of affairs which automatically follows upon a major remodel of the mill—it has to be fought for day after day by that continual attention to detail which is the source of so much successful achievement.

Given regular wheat conditioning and steady weather conditions, in theory a properly adjusted mill will not require the rolls resetting often. In actual practice, the writer has found that under present day milling conditions, the first and second break rolls rarely do require more than a minor adjustment, but that, on the other hand, the later breaks, scratch rolls and fluted reduction rolls need frequent attention if they are to work to the best advantage.

In the successful mill, some of the break roll releases will be weighed out every shift on a rota, so that every fluted roll is checked within the space of 24 hours. To obtain the minimum of variation in performance, the highest degree of scientific control is necessary, because no one can

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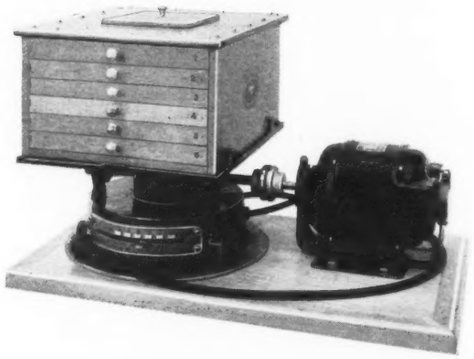

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. . . cuts guess work in setting rolls. Designed to meet the need for a small portable gyratory action sifter to be used in setting rolls for a fixed and determined extraction —PROVES YOUR EXTRACTION SCIENTIFICALLY.

"Rotomatic" is motor driven and can be plugged into any light socket. Automatic stop feature permits each test being made for exactly the same period—may be timed to exact period desired, from a few seconds up to 5 minutes.

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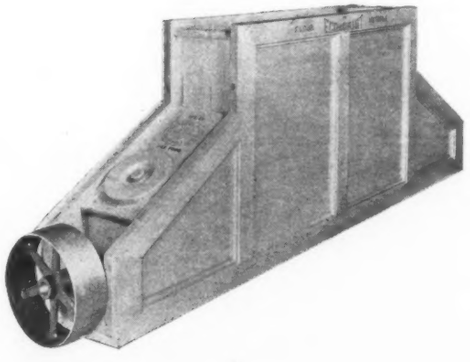

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judge releases accurately enough for modern standards of milling. Rule of thumb methods of control cannot compete, and that is why all the fluted rolls simply must not be set according to the individual views of each of the shift rollermen in turn, good craftsmen though they all may be.

In laying down fixed releases for various rolls, the two following important points should be borne in mind:

(1) Exactly the same procedure in testing must be followed by all operators.

(2) The technical manager must keep the releases he has fixed under constant review, and alter them from time to time should conditions call for a revision of the settings.

In the writer's view, a mechanical sifter should be obtained, if possible, for testing break roll releases, and each sieving test should be made for at least one minute in order to obtain a thorough separation. Good results can be obtained with care by hand sieving, but with a plansifter motion and at plansifter speed (180 r.p.m. approximately).

It is a good plan to count up to 180 in front of a clock when hand sieving, as one soon learns the necessary speed to give 180 r.p.m. and two hand operators working to this system will obtain close results. A recent letter in Milling mentioned a sieving period of only 20 strokes at plansifter speed as being sufficient for testing the work of rolls, but the writer finds a much longer period necessary in order to reduce the margin of error between one test and another.

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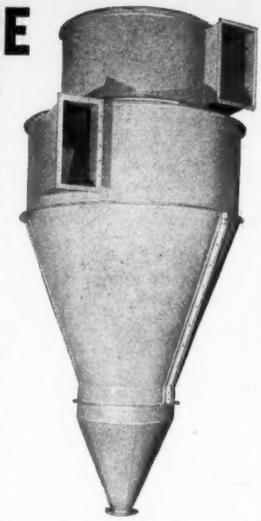

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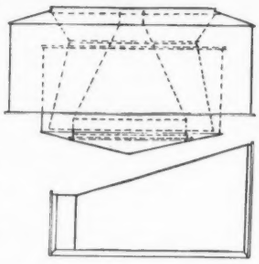

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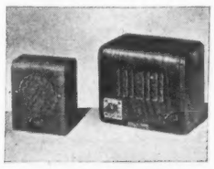

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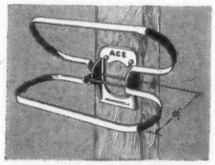

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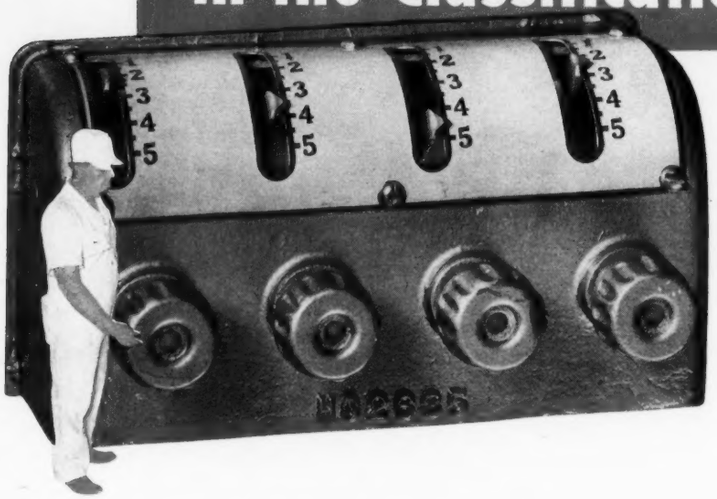

Classification of middlings stock with the Purograder is amazingly accurate and thorough. Large middlings free of loose bran are sent to the coarse sizings roll. Smaller middlings go directly to the fine sizings roll. The bran or beeswing can usually be sent directly to feed. Users report that this accuracy of separation results in longer extraction of high quality patent, also better color.

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In mills fortunate enough to secure installation, the Purograder is establishing an entirely new standard of results in the classification and purification of middlings. Strong air currents have been eliminated. The entire purifying and classifying job is accomplished on a basis of weight, size and shape differences. The unique way in which air is applied reduces loss of moisture in the stock. This keeps middlings mellow, bran tough with the result that bran is more easily flaked and can be more readily scalped off in the following sifter section. Separations and operating results are clearly visible at all times. This eliminates guesswork in regulating the machine.

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Millers interested in learning more about the revolutionary principles and operation of the Purograder are invited to send for free catalog folder. Contains machine description and specifications, closeup views and description of various machine features. No obligation. Write on company letterhead now.

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Stuffed Straights

FROM THE MANAGING EDITOR'S SIFTER

By Carroll K. Michener

NOT SILENT, AS THE "Q" IN BILLIARDS.—It took us some little time, here in this editorial shop, to make up our minds about the final "e" in "thiamine." But we did it, as long ago as midway through 1943. So now it gives us something of a chuckle to see a lofty scientific publication reaching this etymological point a year and a half later. Reference is to Nutrition Reviews, published by the Nutrition Foundation, Inc. In the January number of that journal, under the heading, "Off Again—on Again," we find this statement of confession and conformance:

"In the first volume of Nutrition Reviews thiamine was spelled with an 'e.' In the second volume thiamin was spelled without the 'e,' and at this date it is hard to recollect the exact reason for dropping the 'e,' unless perhaps it was the thought of saving space! And now with volume 3 we are going back to the 'e,' for during the past year it has been repeatedly called to our attention that in 1942 the Nomenclature Committee of the American Society of Biological Chemists, after profound deliberation, decided that the 'e' should be—other societies agree, and now, so do we."

Our Conversion.—The story of our own conversion runs like this: Observing that usage in polite scientific circles at first was variable, and remembering that the pristine mother word vitamin had long since sloughed off its caudal "e," we determined to apply what seemed to be the appropriate journalistic principle of simplified spelling. The economy motive did not present itself to us specifically, as it seems to have done to our scientific confrere, though that may be considered implicit in the simplification theory.

Nutritional eyebrows went up as our "e" went down and out. The real McCoy closed in on us from all sides, and thus we pieced the truth together:

The discoverer of vitamin B_1 spelled its chemical moniker "thiamin," and when this name was first proposed by the Committee on Vitamin Nomenclature for the American Institute of Nutrition and the American Society of Biological Chemists it still had no final "e." The matter of spelling was considered by both organizations and the recommendation of the committee was accepted unanimously, or nearly so. But U. S. Pharmacopoeia did not agree, and listed B_1 as "thiamine," insisting that this spelling was the only one that would be consistent with long established policy. The Council on Pharmacy and Chemistry of the American Medical Association fell in line with this ruling that there should be an "e" appendix and agreed that the correct terminology was "thiamine hydrochloride." However, manufacturers of preparations which were accepted for inclusion in the council's publication, "New and Nonofficial Remedies," were given a suitable period of time in which to use up their old labels, upon which the troublesome name appeared—and still can be seen occasionally—in "thiamin" form.

The official disagreement finally was dissolved in 1942, as Nutrition Reviews has discovered, by acquiescence on the part of the American Society of Biological Chemists in the "e" spelling, and the American Institute of Nutrition concurred.

• • •

. . . **BREAD & GRAVY** gets a big boost from Wilson & Co., Inc., which is putting a gravy on the market and tying it in with its old friend bread in an ecstatic Bread & Gravy Month promotion campaign. "Gravy" for dealers, also—so runs the advertising line: "It will make bread and flour move, because the bakers and the millers are in on this, too." . . . An item in Food and Nutrition News puts another current spotlight on gravy. It says here (Norma Thompson, assistant director of nutrition for the National Live Stock & Meat Board, speaking) that although for decades nutritionists have denounced gravy and meat drippings as being indigestible and "bad for you," they are now finding some value in them in the way of vitamins. Braised meats contain only 45% of their thiamine after cooking, and stewed meats, only 25%; a large part of the vitamins lost from the meat is found in the drippings and gravy. Meat cooked by dry heat methods, roasting, broiling and frying, shows a greater retention of the B vitamins than meat cooked by moist heat methods, according to Miss Thompson.

• • •

SNOW, AND CONTINUED COLD.—The one hundred and fifty-third edition of the Old Farmer's Almanac lies before us. It is in the traditional format, and probably differs from the first annual edition only in minor degree. Its changes in typography are merely technical, and it adheres as closely as possible to the original model, doing its best to make even a freshly-cast modern linotype face look like the inky lettering of old Benjamin Franklin. The engravings are incunabula.

The "table of aspects, holidays, heights of high water, weather, etc.," is in the accustomed pattern. Running down through the antique type styles and the moons and signs of the zodiac, in such a manner as to chart the way of the weather by dates, is this dope on February: "Cold continues. Easterly storm now. Spell of milder weather followed by unsettled days. Indications of a real storm in the making." (The editor claims his long-range weather forecasting is done in collaboration with a secret but impeccable authority.)

Alongside the complicated and intriguing column of meteorological and astronomical data is the familiar "Farmer's Calendar," in which Poor Richard maxims flourished aforetime. Now, for February, there is this:

"The water's frozen stiff again. and you're lugging from the old well. As near as you can figure it, there's only about a month's feed left in the loft, with baled hay selling at forty dollars a ton. The last snow's busted in the hen house roof. Ma's feeling peckish and the price of grain is higher than Gilroy's kite. There you are, knee deep in chores and taxes and government regulations. Take it all in all, the world is just another dish of cold beans.

"You don't know it, but somehow things are going to come around—sure as Town Meeting. They start with the mild spell and a sort of hankering you have to let things slide anyhow. You cut Ma an armful of forsythia branches to 'force' in the parlor window. Maybe you add a few cuttings from the old apple on the sunny side of the lane. Ma perks up—and you go to Grange meeting. Your neighbors lend a hand with the hen house roof. Then one day sap's running—and you're twice as busy as ever—but the smell of the hot, bubbling syrup makes you young again. The boys come down to help after school, and pour the syrup on the snow, and make a real spree of eating it, just as you did when you were a kid.

"Before you know it you've slid right around the corner into March, and Ma's seen the first robin."

• • •

Somehow it doesn't seem at all remarkable that Mrs. Mary Macfadden, in defending the divorce suit brought against her, should term the vigorous Bernarr a crackpot. That's exactly what she called him, and it must be remembered that, just as no gentleman is a hero to his valet, a wife has certain inside tracks to a food crank's character. In denying charges of cruelty, Mrs. Macfadden comes back with the retort that she couldn't stand his using their children as nutritional guinea pigs. Bernarr is 77 and still flexes a mean muscle, 'tis said, nourished by the iron and elixirs of bran mash.

• • •

A survey made by the National Association of Retail Grocers indicates that 62% of our grocers intend to add to their nationally advertised lines after the war, while but 24% of those covered by the study said they would go for more of the private brands.

• • •

It's no sneeze at all for the pepper grinders, what with the squeezing they've had since OPA granted increased prices to importers and the growing scarcity of supplies. Allspice, in fact, to take a sniff of the entire condiment front, seems rapidly to be turning into no spice.

CAPITAL AND CO-OP AS ARNOLD SEES THEM.—Former trustbuster Thurman Arnold sees a sign of decadence in the capitalist system in the present "monopoly stage" of industry. He compares the monopoly stage to old age in an individual. It is a period of caution, fear and restricted activity. Established industry feels itself incompetent to compete in an equal race with new industry.

Arnold, now judge of the U. S. Court of Appeals, Washington, D. C., lists the seven deadly sins of industry as follows:

1. It seeks to consolidate industrial power by destroying individual enterprise;

2. It prevents new enterprise from entering the field;

3. It restricts production and raises prices;

4. It stops the introduction of more efficient methods and maintains obsolete ways of production in which it has vested interest;

5. It sets up arbitrary and despotic control of production and distribution for the security of monopoly groups;

6. It enters politics, using money and economic coercion, and becomes a veritable state within a state;

7. It forms protective tariffs and makes foreign economic policies for the nation, to prevent the countrymen of these monopolists from producing and distributing goods.

Co-operatives have the opportunity "to restore the highways of commerce to the people" by helping to wrest control of these highways from the monopolists. Using a football analogy, Arnold declared that it is the function of government to open a hole in the line of the opposing monopoly team and it is the function of co-operatives to carry the ball of genuinely free enterprise through the hole.

Officials of great corporate enterprise profess their belief in competition, the judge observed, but they are much like the heavyweight champion of the world who is afraid to risk his title in a fight with younger challengers.

Arnold said the rural communities are the real America, but they are communities that are being injured and destroyed by a cartel controlled system of production and distribution.

Everyone is talking about free enterprise but never before was there a greater concentration of economic power in a few hands than today, he pointed out.

Arnold's remarks were made during an address at the Co-op League's Biennial Congress in Chicago.

America's new way of life thus is clearly limned by an illustrious lantern high-placed in government.

Canadian ★ ★

CONDUCTED BY A. H. BAILEY
Manager Canadian Branch
Lumsden Building *Toronto 2, Ontario*
Cable Address, "Palmking"

August-December Flour Production in Canada About Same as Year Ago

Toronto, Ont.—Canadian production of flour in December showed a reduction as compared with the corresponding month of the previous year. The output was 2,029,530 bbls, as against 2,173,433. The falling off is possibly due, in part, to a heavy snowstorm in the early part of the month, which crippled transportation, and the situation has not yet cleared up.

Production of flour in the first five months of the crop year ending with December totaled 10,373,132 bbls, compared with 10,369,958 in the same period of preceding year. Exports of flour in December were higher notwithstanding the decline in production. These amounted to 1,242,370 bbls, as against exports of 1,106,479 in December, 1943. Exports in the five months totaled 5,283,413 bbls, compared with 4,809,541 in the corresponding months of 1943-44 crop year.

Production of winter wheat flour in December showed a substantial increase. The quantity was 93,053 bbls, as against 28,628 in December, 1943. In the five months the output of this flour totaled 450,976 bbls, while in the corresponding period of previous year the amount was 200,725 bbls. More plentiful supplies of wheat combined with improved export demand are responsible for the increased production. However, the quantity of this flour being produced in the current crop season is no greater than in any normal year. It looks large when compared with the preceding year when the winter wheat crop was almost a complete failure.

Canadian mills produced 345,233 tons of millfeed in the five months ending with December, compared with 342,046 in the same months of preceding year. Exports are rigidly restricted and would run somewhere around 5% of production. Domestic demand is abnormally heavy and although almost all the output is available it is inadequate for requirements.

Dominion Officials Optimistic About Canada's Postwar Exporting Business

Toronto, Ont.—A growing volume of inquiries from overseas buyers who are seeking trade connections in Canada is reported by the department of trade and commerce, Ottawa. In the past three months 33 buyers from other countries have been in Canada on trade missions while correspondence is growing steadily.

Translations of letters containing trade inquiries are averaging more than 200 per month. Every attention is given by the department to visitors who come on personal missions of this kind.

Departmental authorities at Ottawa are convinced that out of these preliminary contacts there will grow in time a substantial volume of new exporting trade. The goods wanted are of the kinds Canada can readily produce and for which there are encouraging signs of steady demand abroad. Most of the manufactured products are suitable to the productive facilities of Canada.

In regard to foodstuffs there is no doubt that early postwar years will see an insatiable demand. Capacity to produce will be the only handicap. Flour and cereal millers all know in advance that they are facing one of the busiest periods ever known in their trades and that this may last well into the future.

On its part the government at Ottawa has already made provision for the banking, insurance and shipping requirement of industries that have opportunities for exporting goods overseas. Shipping may involve some difficulties in the early stages but the volume of tonnage created by the war should overcome initial shortages without too much delay.

VANCOUVER SACKING WHEAT FOR SOUTHERN HEMISPHERE

Vancouver, B. C.—Movement of grain from this port to New Zealand, Australia and South Africa was announced during the week. Sacking facilities at local elevators are expected to be taxed to capacity to meet this demand. One elevator has already some facilities, while another plant is putting in a large addition to handle sacked wheat.

It has been learned that arrangements have been made to export at least 15,000,000 bus in sacks and this will require about 25 big freighters to handle the movement.

In addition, there is expected to be a fairly brisk business to Russian ports on the Pacific, both from this port and Prince Rupert.

PRAIRIE PROVINCE MILLERS PLAN MUTUAL ASSOCIATION

Toronto, Ont.—Information from western Canada indicates that the mills of the three prairie provinces are planning to organize a mutual association for the good and welfare of the industry in that part of the country. The millers of Saskatchewan have had an effective organization of this kind for some years but the other two provinces have not been so fortunate. The Saskatchewan association is given credit for originating the idea of one association for all three provinces. An organization meeting of the Alberta millers was held in Edmonton last month and a meeting of the Manitoba millers is to be held in Winnipeg on Feb. 27. The effectiveness of collective action in matters of general interest has been recognized time and again in industry and it is felt that an organization of the kind planned will be highly beneficial to western millers. Exchanges of views and opinions from various parts of the three provinces will be helpful and the general fund of information made available to members of such an association will also be a considerable asset.—A. H. B.

——BREAD IS THE STAFF OF LIFE——

BRAZILIAN COMPANY SHOWS PROFIT INCREASE IN YEAR

London, Eng.—Net profit for the year ended Sept. 30, 1944, of the Rio de Janeiro Flour Mills & Granaries, Ltd., amounted to $289,150, compared with $274,845 for the year previous, according to a report presented by S. C. Sheppard, the chairman, at the annual meeting of the company in London Jan. 28. The directors recommended a dividend of 8%, less tax.

Mr. Sheppard said that the past year had been one full of difficulties. There had been stricter control than ever in the selling prices of all their products and transport conditions had become more and more restricted. The company was fortunate, however, in being able to draw its wheat supplies from Argentina where f.o.b. prices are still below those of almost any other country.

Financially, the company had had to cope with further increases in operating expenses for both wages and salaries had advanced following the general increased cost of living in Brazil. Freight rates and other general expenses had also advanced, whereas controlled selling prices were seldom allowed to advance proportionately, and with never-ending local taxes and the taxes payable in Great Britain, the general expenses were increased considerably.

The management in Brazil, however, had recently reported by cable that trading conditions continued satisfactory and it was hopeful of obtaining some improvement in local controlled prices within the near future.

——BREAD IS THE STAFF OF LIFE——

EXPORT COMPLIANCE URGED

Toronto, Ont.—The Department of Trade and Commerce, Ottawa, is advising Canadian exporters that the British West Indies import control authorities continue to insist on proof as to the quota year to which goods arriving in the British West Indies after Jan. 15, 1945, were charged. While the Export Permit Branch does not consider that this proof is necessary, in view of the fact that export permits are charged to the quota year indicated on the relevant import license, it is, however, suggested and strongly advised that, in order to facilitate the entry of their goods into British West Indian territories, exporters clearly endorse on the commercial invoice covering the shipment the relevant British West Indies import license number and date, together with their Canadian export permit number and date of issuance.

CANADIAN EXPORT WHEAT PRICE STANDS AT $1.40

Winnipeg, Man.—Canadian wheat exported to nations not receiving mutual aid is being sold at a rate of more than $1.40 bu, basis No. 1 northern at Fort William, according to a review by the Dominion Bureau of Statistics.

Canadian wheat for export is sold under a two-price policy. The class one price applies to mutual aid countries and the basis is $1.25 bu No. 1 northern at Fort William, purchases being made by the Canadian Wheat Board. The class two price for nonmutual aid countries, including the United States, has a degree of fluctuation.

Wheat supplies were taken over by the wheat board in the fall of 1943 when the Dominion government announced closing of the Winnipeg wheat futures market. In October, 1943, the board reported prices for nonmutual aid countries at $1.28¼ bu, basis No. 1 northern at Fort William. In April and May, 1944, this price had risen to $1.48, dropping back to $1.35¼ in August.

——BREAD IS THE STAFF OF LIFE——

FLOUR SHIPMENTS DELAYED IN CANADA BY BAD WEATHER

Toronto, Ont.—Grain shipping conditions in Canada, east of the Great Lakes, are growing steadily worse and both mills and feed dealers in some cases are scraping the bottoms of the bins.

Many of the spring wheat mills have had their production seriously curtailed by the scarcity of grain for grinding and others are unable to get their flour shipped out. The general scarcity of boxcars has been aggravated by heavy snowfalls during the last two months, which slowed up movement. Then again a considerable number of cars have been diverted to the export movement of grain which has added to the seriousness of the situation in the flour industry.

Although flour is badly needed in export markets, mills are unable to accept further orders until present contracts are nearer completion and at present shipments are almost at a standstill.

——BREAD IS THE STAFF OF LIFE——

ARIZONA VACATION

Toronto, Ont.—Norman H. Campbell, of the Lakeside Milling Co., Ltd., Toronto, left on Feb. 8 for a trip to Arizona for vacation and health reasons. He will join his brother, D. A. Campbell, president and managing director of St. Lawrence Flour Mills Co., Ltd., Montreal, Que., who also is vacationing in Arizona.

——BREAD IS THE STAFF OF LIFE——

PLAN JOINT BAKERS' MEETING

Toronto, Ont.—A joint conference of the Ontario Bakers Association, the Independent Master Bakers Association of Ontario and the Ontario Retail Bakers Association will be held at the Royal York Hotel, Toronto, on April 17-18. Organization for this event is now in progress.

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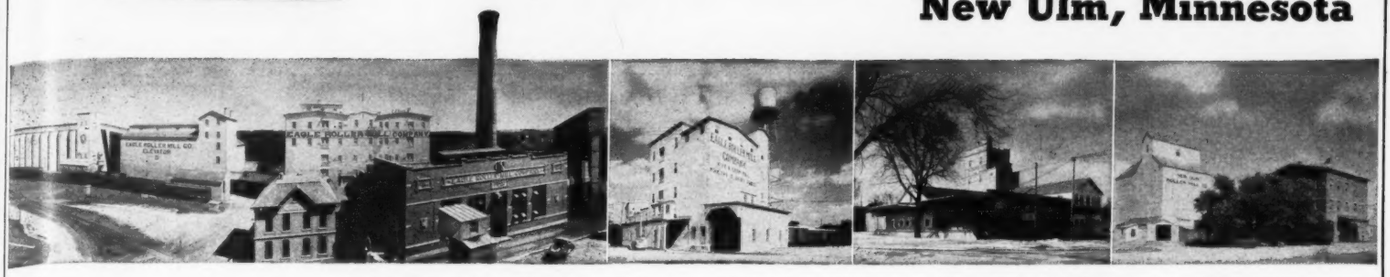

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Millers of Hard and Soft Wheat Flour
DAILY CAPACITY 2,100 BARRELS

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Milling Wheat and Coarse Grains
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Spring Wheat Fancy Patent Family Flour

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Manager European Branch
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"Northwestern Miller, Mark Lane, London"

FLOUR TRADE GROUP REVIEWS PAST YEAR

No Change in Position of Imported Flour; J. H. Pillman Continues in Charge

London, Eng.—The annual general meeting of the London Flour Trade Association was held Jan. 24 in the Subscription Room of the London Corn Exchange, when the annual report and accounts were presented and adopted. The report, in brief, was as follows:

J. H. Pillman, Pillman & Phillips, has continued in charge of the import flour trade at the imported cereals division of the Ministry of Food. Gordon Ravenscroft, of Ross T. Smyth & Co., Ltd., has remained as flour agent on the London Port Area Grain Committee.

Remuneration of controlled flour firms is now conducted by an association appointed for the purpose during the past year, known as the Flour Importers (Distribution and Control) Association, Ltd., under the Ministry of Food, and for the fourth year the agreed amount has been paid.

There has been only one change in the price of National Flour during the year. On Oct. 1, it was advanced 1s 9d per 280 lbs to 40s in charged bags or 41s per 280 lbs in nonreturnable bags. Imported flour also was increased to 41s per 280 lbs, bags included. All prices delivered.

On the same date the flour extraction for national flour was reduced from 85% to 82½% (since reduced to 80%).

There has been no change in the position in regard to imported flour. Separate distribution is still prohibited, except in Scotland. The millers mix a percentage of imported flour into the national flour as instructed by the Ministry of Food. During the year this percentage has varied from 5 to 12½%.

A subcommittee of the postwar Reconstruction Committee met and considered many points in this connection and duly submitted a report to the National Association of Flour Importers. A special committee was formed by the National Association to deal with the matter and at the subsequent meetings arranged the discussions covered a wide field.

The annual meeting of the National Association of Flour Importers was held in London on Sept. 27, 1944, when F. W. Peach, London, was elected president for the ensuing year and J. B. Russell, Glasgow, vice president.

The accounts show the financial position of the London Flour Trade Association to be satisfactory, the accumulated fund held by the association amounting to £3,741 17s 8d.

——BREAD IS THE STAFF OF LIFE——

AN APPEAL FOR BREAD

London, Eng.—An appeal was recently made to farmers over the Dutch radio, operating under allied control, for the delivery of wheat and rye as quickly as possible. Civilians, it was said, urgently need bread. It is understood that stocks of threshed grain have reached a very low level. It was reported recently that a Red Cross ship was expected to leave Lisbon for occupied Holland with supplies of food, including 5,000 tons of wheat and lentils.

——BREAD IS THE STAFF OF LIFE——

GRAIN NEEDED IN FINLAND

London, Eng.—Finland is short of grain and has appealed to the U.S.S.R. to supply its urgent need. Russia's response, according to the Moscow radio, is the promised dispatch of some 30,000 tons of grain to Finland.

——BREAD IS THE STAFF OF LIFE——

G. BRUCE SMALL RETIRES FROM ASSOCIATION POST

London, Eng.—G. Bruce Small, who for over 17 years was secretary of the National Association of Master Bakers, Confectioners and Caterers, resigned at the end of 1944. His place was taken by L. F. Cadwallader, assistant secretary for the last six years.

It was Mr. Small's intention to retain the editorship of the association's weekly publication, The National Association Review, and to act as consultant secretary. However, his health was impaired further by a serious bout of illness involving a second major operation in the fall of 1944, and he decided, on his doctor's advice, to retire from all business activities. He has made a good recovery from his recent operation.

Mr. Bruce Small is a Scotsman and served the Scottish Association of Master Bakers as secretary in Edinburgh for 11 years before taking office with the National Association in London. Throughout his long years of service for the two associations he has shown outstanding ability and zeal in his work for the baking industry and not only is highly respected by the baking fraternity but also has won its affection. His enforced retirement from their midst owing to health reasons is deeply regretted. Last year Mr. Small celebrated his golden jubilee as a journalist.

——BREAD IS THE STAFF OF LIFE——

JOINS PARENT COMPANY STAFF

London, Eng.—William C. Tudor has been appointed a member of the executive staff of Henry Simon, Ltd., and will be responsible for the company's relations with its overseas companies and branches. He will also take charge of the company's business outside Europe. For the past eight years Mr. Tudor has been managing director of the organization's subsidiary company in Buenos Aires, Argentina.

——BREAD IS THE STAFF OF LIFE——

GAIN IN BRITISH BUYING OF CANADIAN WHEAT SEEN

London, Eng.—During the early days of January Switzerland bought 500,000 bus of Canadian wheat and, apparently, Portugal was also seeking supplies from the same source. It is pointed out in the British trade press that hitherto the Canadian Wheat Board had refused to entertain bids from nonmutual aid countries, claiming that stocks of Manitoba wheat in exportable position were only sufficient for the needs of the United Nations. Higher prices, however, are asked for the wheat than from the mutual aid countries.

An increased demand for the higher grades of Canadian wheat is likely to be experienced from the United Kingdom now that the flour extraction has been reduced to 80%. It is believed, however, that Canada with her large exportable surplus will not only be able to supply Europe's needs, but also provide supplies for those destinations hitherto supplied by Australia, which country, it is feared, will only have sufficient for her own requirements this year.

It is thought possible that Canadian shipments overseas will reach a high record level. It is estimated that these shipments, including those to the United States, will be in the neighborhood of 400,000,000 bus.

——BREAD IS THE STAFF OF LIFE——

Government Forbids Sale of Small Rolls of Bread in Roumania

London, Eng.—A correspondent of the Liverpool Corn Trade News reports from Roumania that recently the government prohibited the sale of small rolls and half-moons of a few grammes weight, but still allows the sale of the ordinary dark bread standard loaves. No reason was given for the prohibition, but small rolls of bread result in some increase of consumption and the idea may be to cause a decrease.

"Bread consumption in Roumania," continues the writer, "must be quite considerable and increasing. The price of the standard brown loaf has been raised, but is less than half the price of white bread, which remains unrationed."

The same informant reports that as far as he can gather there is not likely to be much wheat exported from Roumania for the present, although the 1944 harvest was satisfactory in regard to cereals.

MUSICAL DUBLIN BAKERS

★

London, Eng.—The Dublin bakers and confectioners are planning to provide a concert hall for their city, which although a center of musical culture possesses no suitable concert hall. Hitherto no practical scheme has been put forward but now the Bakers, Confectioners and Allied Workers Union want new offices and a place of meeting for their members. Already they have bought a site and the plan is to erect a large building in which there will be several suites of offices and a concert hall that will seat 1,000 persons. The Union has good reason to expect that the hall will prove a profitable investment and already two of the Dublin musical societies have promised their support.

Belgian Officials Seek Additional Imports of Food

London, England.—A recent statement by the Belgian Minister of Supply states that his country is suffering from a serious lack of fats and oils. This fact also was revealed by an inhabitant of Ghent who said that throughout the German occupation they had had no fats nor soap, the Germans commandeering all such supplies. A friend in Portugal occasionally sent him a tin of sardines, which was worth its weight in gold for the oil it contained.

The Belgian minister also stated that fertilizers are badly needed in Belgium and that cattle food is practically nonexistent. He added that the Belgium government had asked for facilities to import during the next three months more than one tenth of the prewar imports of food and raw materials.

M. Pierlot, the Belgian Prime Minister, has also spoken on the serious food situation in Belgium, and urged, so far as military interests permit, importations of food so that the daily rations of the people may be increased to 2,000 calories. At present the rations represent only 1,400 calories.

Another report states that the opportune arrival of 4,000 tons of allied foodstuffs helped to save a very serious situation. These allied supplies included 250 tons of fats, 140 tons of chocolate, 130 tons of condensed milk, 550 tons of biscuits and 400 tons of white flour.

About Christmas time the first liberty ship flying the Belgian flag entered the Port of Antwerp with a cargo of 10,000 tons of foodstuffs. The ship was bought by the Belgian government in London—the first of many. A consignment of 2,000 tons of cattle food also is shortly expected from the Belgian Congo.

——BREAD IS THE STAFF OF LIFE——

NET PROFIT DOWN

Montreal, Que.—Catelli Food Products, Ltd., manufacturer of macaroni, spaghetti, etc., reports a net profit in 1944 of $76,910, equal to $1.05 a share on the common stock, compared with $84,305 or $1.21 on the common stock in the previous year. Operating profit amounted to $237,712 compared with $287,950. Surplus was $36,653 as against $44,049 and earned surplus was up to $263,214 from $229,465. Balance sheet showed current assets at $685,575 and current liabilities at $281,199. Working capital was $404,376, an increase of $163,263. During the year a call loan of $100,000 was paid off.

——BREAD IS THE STAFF OF LIFE——

GLASGOW OFFICERS

London, Eng.—At the annual general meeting of the Glasgow Corn Trade Association, Ltd., James Aitken, James Aitken & Sons, Glasgow, was re-elected chairman for the current year, and J. B. Russell, D. T. Russell & Baird, Ltd., Glasgow, vice chairman.

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DOMESTIC and EXPORT MILLERS

6,000,000 BUSHELS
COUNTRY AND TERMINAL STORAGE

GOLD DROP *PIE and COOKIE FLOUR*
PYRAMID *CONE FLOUR*
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DEALERS IN
ALL TYPES OF PACIFIC NORTHWEST WHEAT

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Fisher's FOR UNIFORM FLOURS

The largest and most modern flour mill and elevators on the Pacific Coast with storage capacity at our mills of 2,500,000 bushels, together with more than one hundred elevators and warehouses in the choicest milling wheat sections of Montana, Idaho and Washington, insure the uniformity of all Fisher's Flours.

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PENDLETON, OREGON

Millers of Export and Domestic Flours

Daily Capacity, 1,000 Barrels
Correspondence Solicited

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BURLAP AND COTTON BAGS AND SEWING TWINE

CROWN MILLS
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"THE FLOUR SUPREME"

Millers of High Grade Bakers, Family and Export Flours.

WESTERN MILLING CO.

MONTANA SPRING WHEAT PATENT
BLUESTEM—PATENT
FINEST SOFT WINTER WHEAT PATENT

General Offices: Walla Walla, Washington — Mill at Pendleton, Oregon

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Wheat, Rye, Corn and Buckwheat Flours

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Distinctive Quality and Flavor

EXCLUSIVE MILLERS OF RYE FLOUR

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"WISCONSIN MAKES THE BEST RYE FLOUR"

Export Flour Insured ALL RISKS by

The Sea Insurance Co., Ltd.
of LIVERPOOL

U. S. Branch Assets	$4,904,187
Capital Deposited in U. S.	500,000
Surplus for Protection of Policyholders	2,930,199

ORIGINATORS OF ALL RISKS
Insurance on Flour
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United States Managers
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Insurance Exchange - - Chicago
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Royal Bank Building - - Montreal

CORN — BOTH WHITE AND YELLOW

Eberhardt & Simpson Grain Company

Milling Wheat SALINA, KANSAS *Feed Grains*

C. Everett Casto

. . . president . . .

C. Everett Casto, previously vice president, was elected president of the Ward Baking Co., New York, a short time ago. A. E. Tolley, previ-

Albert E. Tolley

. . . executive vice president . . .

ously vice president, was elected executive vice president. E. A. McLaughlin, previously general sales manager, was elected a vice presi-

Edward A. McLaughlin

. . . vice president . . .

dent and a director of the company.

M. E. Manbeck of the Manbeck Baking Co., Le Moyne, Pa., is the new

M. E. Manbeck

. . . vice president . . .

vice president of the Pennsylvania Bakers Association, elected at the recent annual meeting of the organization at Pittsburgh.

Personal & Otherwise

Philip W. Pillsbury, president Pillsbury Mills, Inc., visited the company's Kansas City office for a day last week before going to the mill at Atchison, Kansas, and then returning to Minneapolis. Mr. Pillsbury has many friends in Kansas City, where he spent a year managing the sales office.

●

P. H. Baum, vice president and director of sales for the William Kelly Milling Co., Hutchinson, Kansas, made a short trip to the southern states. **Fred N. Burrall,** general sales supervisor, left for an extended visit with the trade in several eastern states.

●

H. P. Lorenz, manager of the Hutchinson office of the Shellabarger Mill & Elevator Co., Salina, was chosen president of the newly organized Hutchinson chapter of the Society for the Preservation of Barber Shop Quartet Singing of America.

●

W. R. Heegaard, vice president and sales manager of the Russell-Miller Milling Co., Minneapolis, with Mrs. Heegaard, left Feb. 10 for a few weeks' vacation at Miami Beach, Fla.

●

H. R. McMartin, in charge of exports for King Midas Flour Mills, Minneapolis, is visiting Cuba.

●

The Toledo Small Business Association, with membership of 700, has re-elected **O. E. M. Keller,** president of Kasco Mills, as president, and **Kenton D. Keilholtz,** of Southworth & Co. and Southworth Grain Co., as secretary and treasurer.

●

A. P. Cole, J. C. Stewart Co., Pittsburgh, and **C. H. Morris,** Cliff H. Morris & Co., New York, visited in Chicago last week. Mr. Cole had been to Minneapolis and St. Louis, and before returning to Pittsburgh spent a few days with his son and family in Chicago. Mr. Morris left Chicago on a business trip to the Pacific Coast.

●

Armin J. Keller, of the grocery products division of General Mills, Inc., Chicago, observed his twenty-fifth anniversary with his company on Feb. 9. Mr. Keller started with Washburn Crosby Co. in 1920 in the Chicago branch sales office, and later for a number of years was a bakery sales representative.

●

P. G. Bush of the Bush Brokerage Co., Nashville, has returned from a business trip through Illinois.

●

Cohen Williams, Jr., president of the Royal Flour Co., Nashville, returned last week from Atlanta, where he had been on business for several days.

●

W. P. Tanner of Tanner-Evans-Siney Corp., New York, has left the hospital after an eye operation and is resting at his home in Norwalk, Conn. His son, **Wilson P. Tanner, Jr.,** A.R.T. 3/c, U. S. Navy, has just been home on leave.

●

J. A. Lenhardt, who has been active in the flour milling and brokerage business for many years, is now associated with the export department of Irving R. Boody & Co., Inc., of New York, handling flour and other exports to several countries.

●

Phil Orth, head of the Ph. Orth Co., Milwaukee bakery supply house, has been named a member of the executive committee of the Midsummer Festival Commission which will be in charge of a centennial observance in 1948 for Milwaukee and the University of Wisconsin. The commission also will be in charge of a pageant at the Milwaukee Auditorium, Jan. 31, 1946, to observe Milwaukee's one hundredth birthday.

●

Robert J. Matchett, of the sales department of the New York offices of Pillsbury Mills, Inc., has returned to his desk after illness had confined him at home for over two months.

●

George Gesegnet, Buffalo flour broker, was introduced on the New York Produce Exchange by **Charles C. Chinski,** and **Arthur Baker,** sales manager for Flory Milling Co., Bangor, Pa., was introduced by **David Coleman.**

●

A. L. Jacobson, president of Arnold Milling Co., Sterling, Kansas, is spending a few weeks in and near Pasadena, Cal., to soak up some winter sunshine.

●

W. L. Cooper, southern Illinois representative for Larabee Flour Mills Co., Kansas City, visited the home office last week. Mr. Cooper lives in Fairbury, Ill.

●

O. A. Rector, manager of the feed department, Jesse C. Stewart Co., Pittsburgh, and Mrs. Rector are spending a six weeks' holiday at Coral Gables, Fla.

●

Theodore Riedeburg, of the insecticide division, Dow Chemical Co., Midland, Mich., spent the fore part of this week in Minneapolis in the interests of his company.

●

I. C. Maghran, of Buffalo, eastern manager, bulk products sales, Pillsbury Mills, Inc., gave a vivid picture of how flour is milled from the grain to the finished product in a speech Feb. 5, before the Lions Club of Buffalo. He said that before the war, the grain, feed and flour industry provided the biggest flow of dollars through the city but since the war the airplane industry has jumped into the lead.

●

Among visitors in Chicago last week were: **R. B. Laing,** Abilene (Kansas) Flour Mills Co; **Elmer E. Huffman** and **Ward Magill,** Kansas Milling Co., Wichita; **Sydney Anderson,** General Mills, Inc., Minneapolis; **Howard W. Files,** Pillsbury Mills, Inc., Minneapolis; **J. J. Selvage,** General Mills, Inc., Atlanta.

●

W. Howard Chase, director of Public Services, General Mills, Inc., recently spoke before the Minneapolis Advertising Club clinic at the Covered Wagon. He spoke on "Public Relations."

●

Arthur A. Lederer, Arthur Lederer Milling Co., Cleveland, and Mrs. Lederer are spending the month of February at Miami Beach, Fla.

—BREAD IS THE STAFF OF LIFE—

HAROLD HUTTON HONORED

Newark, N. J.—Harold S. Hutton, sales manager for Wallace & Tiernan Co., Inc., on completion of 25 years with the company, was honored Feb. 8 at a dinner at the Montclair (N. J.) Golf Club, sponsored by the Wallace & Tiernan Diamond Club whose members have had 10 years or more service with the Wallace & Tiernan industries. Mr. Hutton joined the company following his discharge from the army of World War I, where he served as first lieutenant in the Engineer Corps. He is a graduate of Columbia University, was an officer in the United States Public Health Service, and prior to coming to Newark was district and division manager with headquarters in Pittsburgh.

ROBIN'S BEST FLOUR
The ROBINSON MILLING COMPANY
SALINA, KANSAS
ACCEPTED AMERICAN MEDICAL ASSN.

ARNOLD
...of...
STERLING
Mills and Sells
"Thoro-Bread"
(Diastatically Balanced)
A very fine, strong, altogether uniform and dependable flour
•
ARNOLD MILLING CO.
STERLING, KANSAS

Since 1882
BUFFALO
BUFFALO
BUFFALO

"SUPERFLOUR"
"BUFFALO"
Tops in Bakery Flours
★ ★
THE WILLIS NORTON CO.
Quality Millers Since 1879
Capacity 1,500 Bbls. WICHITA, KANSAS

American Ace
—A very fine, short, strong patent milled in one of the West's very finest flour mills.
American Flours, Inc.
NEWTON, KANSAS

VANITY FAIR
TELEPHONE
MARITIME
INVADER
(HIGLUTEN)
"MASTER MILLED" Spring Wheat Flour
CANNON VALLEY MILLING COMPANY
Chamber of Commerce · Minneapolis

STANDARD MILLING COMPANY
Millers of
•CERESOTA •ARISTOS
BAKERY FLOURS

ACME
BAKERS SHORT PATENT
FLOUR
Also "GOLD DRIFT"
These Brands Meet Every Shop Need
The ACME FLOUR MILLS CO.
Oklahoma City, Okla.

Chickasha Milling Co.
Capacity 800 bbls. CHICKASHA OKLA. Cable Address "Washita"
Manufacturers of High-Grade Hard Wheat Flour
Foreign and Domestic Trade Solicited
Member Millers' National Federation

We are always ready to fill your requirements of
MILLING WHEAT
MOORE-SEAVER GRAIN CO.
Operating Kansas City Southern Elevator Kansas City, Mo.

A Real Gem in Flour
KANSAS DIAMOND
Made by
Arkansas City Flour Mills Co.
Arkansas City, Kansas
Daily Capacity 2,000 bbls

"CREMO"
Just the Cream of Hard Wheat
CROOKSTON MILLING CO.
CROOKSTON, MINN.

Victor-Champion-Frost King-Headliner
Family Flour De Luxe
THE CRETE MILLS
CRETE, NEB.

TOWN CRIER FLOUR
MIDLAND FLOUR MILLING CO.
2010 Taney Ave. No. Kansas City, Mo.

HARDESTY MILLING CO.
Quality Millers *for* Over Half a Century
Domestic and Export DOVER, OHIO

DOBRY'S BEST
and
BEST OF THE WEST
DOBRY FLOUR MILLS, Inc.
YUKON, OKLAHOMA

We Offer (Vacuum Cleaned) Reconditioned
FEED BAGS
Cotton or Burlap
All Sizes and Weights
MINNEAPOLIS BAG & BARREL CO.
237 First Avenue North, AT. 2379
MINNEAPOLIS, MINNESOTA

HIGH GLUTEN FLOURS
For Bakers
The Morrison Milling Co.
Denton, Texas
Emphatically Independent

"Golden Loaf" That's Our Brand—
The Flour with the Doubt and Trouble left out
TENNANT & HOYT COMPANY
Lake City, Minn.

THE WALNUT CREEK MILLING CO.
Millers of Fine, Country-Milled Kansas Wheat Flours
Since 1877
GREAT BEND, KANSAS

295,344,064 Lbs Flour Sold Under Export Subsidy

Washington, D. C.—Through Feb. 9, exporters had reported to the Commodity Credit Corp. export sales of flour under the wheat flour export program aggregating 295,344,064 lbs.

Wheat exporters had reported aggregate export sales under the wheat export program of 290,882 bus of wheat.

The flour and wheat sales together are equivalent to approximately 7,231,400 bus of wheat.

Totals by destination countries are as follows:

	Flour (lbs)	Wheat (bus)
Cuba	200,188,270	48,550
Haiti	10,287,736	....
Neth. West Indies	1,772,648	....
Dominican Republic	875,100	6,000
Jamaica	485,400	....
British Virgin Islands	10,000	....
Brazil	20,185,741	....
Ecuador	16,847,873	....
Venezuela	12,692,302	....
Colombia	1,231,360	151,279
Surinam	333,930	....
Guatemala	5,889,688	....
Costa Rica	4,780,750	....
El Salvador	4,724,083	....
Panama	3,604,258	....
Nicaragua	3,578,165	....
British Honduras	3,493,800	....
Honduras	738,840	12,000
Newfoundland	24,750	....
Tangier	3,433,520	....
Morocco	65,850	....
Portugal	100,000	....
Mexico	....	39,721
Misc.	....	*33,332
Total	295,344,064	290,882

*Sales not definitely identified.

——BREAD IS THE STAFF OF LIFE——

FAMILY FLOUR MEMBERSHIP COMMITTEE PLANS DRIVE

Nashville, Tenn.—A meeting of the regular membership committee of the Family Flour Institute, Inc., of which Norman Christley of the Columbia (Tenn.) Mill & Elevator Co., L. A. Brooks of the Cosby-Hodges Milling Co., Birmingham, Ala., and T. H. Baum of the William Kelly Milling Co., Hutchinson, Kansas, are members, was held Feb. 10 at the Noel Hotel, Nashville, for the purpose of taking whatever steps are necessary to secure additional regular members for the institute.

Wheat Subsidy

(Continued from page 9.)

not be made on wheat ground after June 30. Notice of termination on June 30 would be required 120 days before that date. This course would permit continuation of flour sales, and flour sold and produced prior to June 30 would be eligible for the subsidy. In short, all mills would be put on equal footing with a net forward sales position of 120 days.

This second possible course would postpone the decision on the future of the subsidy program until after June 30, an unsatisfactory condition. Pressure on mills to sell beyond that date would be great and the legality of the DSC action under its Regulation No. 4 would be in question. Mills with a large unfilled order balance as of Nov. 30 would be unable to recover the deduction made at the beginning of the program on account of those balances.

DSC Decision

After weighing these alternatives, DSC has decided to continue the subsidy program on the present basis with notice to the industry that unless affirmative action is taken by Congress in the meantime in regard to subsidy funds, no payments will be made on wheat ground after June 30. This ruling is contained in the following letter, dated Feb. 10, to Herman Fakler, of the Millers National Federation:

Dear Herman: Reference is made to your letter of Jan. 25, 1945, inquiring about the effect of the requirements of the so-called Taft amendment to the Emergency Price Control Act of 1942, as amended, on the termination provisions of the flour production payments program.

Under existing statutory provisions, this corporation has authority to pay subsidies only on that portion of the forward sales which is actually ground into flour on or before June 30, 1945. Consequently, in the absence of additional appropriate legislation, no payments can be made on any wheat which is not ground into flour prior to that date, regardless of the fact that the 120-day period may not have expired. Nevertheless, we do not propose to terminate the program at this time in order to allow the 120 days to expire before July 1, 1945, and payments, subject to the limitation referred to above, will continue under the program as heretofore.

Very truly yours,

STEWART K. BARNES,
Vice President.

Warning to Millers

With announcement of the DSC ruling, Mr. Fakler issues the following warning to the milling industry:

"It is important that everyone in the industry take notice of this situation and make no sales of flour for grinding after June 30 with the expectation that a subsidy will be paid with respect to such sales and grind. However, until June 30, or until Congress acts affirmatively, millers can continue to sell flour with the benefit of the subsidy providing it is ground out on or before June 30. DSC can make payments in July for the grind which takes place in June, or before, and claims for the grind before July 1, 1945, will be honored in the regular course."

The Bakery Problem

Top food price officials at OPA admit the baking industry problem arising from lard and sugar shortages have reached their attention and point out several courses open.

First, it might be necessary to undertake a cost study of the industry to determine the extent of the price increase necessary to prevent actual loss or to maintain the profit position of the industry at the levels of the basic period of 1936-39. However, such cost studies would involve a considerable period of time and probably could not be completed in time to permit remedial action if stoppage of production was threatened.

However, if actual stoppage of production threatened, OPA might, as second alternative, order a preliminary price adjustment pending a comprehensive study of industry costs on the basis of expected volume of sales.

These alternatives could be taken by OPA without consulting Judge Vinson, director of economic stabilization, as these circumstances are covered in the requirements of the stabilization act.

If it appears necessary to make a broad upward adjustment of bread prices to maintain production or to hold the industry profit level in line with the 1936-39 period, it is entirely possible that OPA may recommend that the subsidy program be transferred from the milling to the baking industry level. This plan was advanced last fall when the subsidy program was under discussion but was protested vigorously by the baking industry. At that time OPA officials contended that the subsidy payment at the baking level would effect a saving of approximately $50,000,000 annually to the government. This estimate was predicated on the claim that the baking industry included approximately 19,000 outlets and that the subsidy claims could be paid on the basis of poundage of bread produced in a subsidy period.

The convergence of those two acute problems undoubtedly will lead a review of the entire subsidy program with the position of the various government agencies uncertain at this time. Shortly Congress will take up consideration of the extension of the stabilization act and OPA recommendations may be colored by their analysis of the attitude of Congress toward further grants of subsidy money. If Congress appears hostile to further subsidy operations OPA may decide to whittle down its request by advocating subsidy use at the bakery level if it can be demonstrated that this action will reduce the total subsidy outlay.

——BREAD IS THE STAFF OF LIFE——

BAKERY STRIKE ENDS

Louisville, Ky.—A four-day strike of production workers of the Donaldson Baking Co., Louisville, in which about half the 120 production workers quit, was called off Feb. 5, after a conference of company officials and union leaders, in which T. B. McConnell, NLRB conciliator, conducted the negotiations. The union had demanded that all new men employed in production must first join the union, but that nonunion men already employed would not be affected. This would have resulted in a closed shop to new workers and the company refused. Eventually the clause was deleted from the contract by agreement.

——BREAD IS THE STAFF OF LIFE——

JOHN V. SUTER IS DEAD AFTER MONTH'S ILLNESS

John V. Suter, for the last 10 years representative for the Rodney Milling Co., Kansas City, in Ohio, died early Feb. 7 at the Mercy Hospital, Cincinnati. He had been ill for about a month and only recently had been confined to the hospital. Mr. Suter, well known in the flour industries, was for many years with the Washburn Crosby Co. in Ohio, and for the Rodney company handled the entire state exclusive of Cincinnati. Funeral services were held Feb. 10.

WMC LIST APPLIES ONLY TO 26-29 AGE GROUP

Washington, D. C.—The Millers National Federation has called attention to the fact that many local draft boards are overlooking the important point that the War Manpower Commission list of critical activities applies only to men in the 26-29 age group and is not applicable to employees between the ages of 30 and 37. Employees in the milling industry in the latter age group are on an equal basis with employees in other critical industries and are listed as essential.

Thomas Introduces Bill for New Parity Calculation

Washington, D. C.—To bring higher returns to farmers, Senator Thomas of Oklahoma, new chairman of the Senate agriculture committee, last week introduced in the Senate his bill to raise parity prices. The bill, which would become effective 90 days after the war, sets parity prices at a level estimated to bring farmers the same return in purchasing power they received during the 10 years 1919 to 1929.

In addition the bill provides an allowance be made in the parity formula for cost of hired labor, plus a consideration for value of labor performed by members of farmers' households. At present there is no provision for farm labor costs.

Present parity prices are designed to bring farmers a return equal to what they received during the five years 1909-14. It has been estimated that if the Thomas bill were in effect now parity wheat would be $1.83 bu, against $1.52 on Jan. 15; cotton, 29.63c lb, against 21.33c.

Most other important agricultural commodities would be boosted similarly, though a few would rise only slightly. Barley and burley tobacco would drop a bit.

——BREAD IS THE STAFF OF LIFE——

JOHN F. MAC LAREN DIES

One of Ontario's Oldest Flour Trade Members Succumbs at Home in Toronto

Toronto, Ont.—The death of John Ferguson MacLaren at his home in Toronto on Feb. 7 removed from the Ontario flour trade one of its oldest members. He was 94 years old. More than 45 years ago when the big western spring wheat millers in Canada were making a place for their flour in the more populous parts of Ontario, Mr. MacLaren became known to the bakers as a friend and counsellor when he was manager of the Toronto office of Ogilvie Flour Mills Co., Ltd. After many years of service he retired following World War I in 1918. In the interval he has kept his health and, as much as possible, his contacts with the flour trade. His wife is still living.

——BREAD IS THE STAFF OF LIFE——

C. J. DE ROO, PIONEER MICHIGAN MILLER, DIES

Flint, Mich.—C. J. De Roo, 89, long identified with the milling business in Michigan, died Feb. 4 at his home in Flint.

Mr. De Roo was a member of a pioneer milling family in Michigan. His father settled in Ottawa County in 1847 and built the first flour mill in that section of the state. Mr. De Roo engaged in the milling business at Zeeland in 1879 and later at Holland, Mich., where he was mayor of that city for several years.

In 1907 he established the Peninsular Milling Co. at Flint. Of late years that company has not been manufacturing flour but has been a distributor of flour and feed.

Mr. De Roo was chairman of the board of the Michigan Millers Fire Insurance Co., Lansing, until last year when he retired because of poor health after 50 years as a member of the board.

As fine a flour as you will find milled from the finest Turkey wheat in the heart of Kansas in

An Independent Mill

WOLF MILLING CO.
ELLINWOOD, KANSAS

IF BUYING
MILO ★ KAFIR
Phone—Wire—or Write
Transit GRAIN COMPANY
FORT WORTH 1, TEXAS
Handling ALL OTHER GRAINS and FIELD SEEDS

ROYAL FLUFF-EAT-A

It pays to pick the right cake flour! Average flours really cost more than top quality flours like ROYAL FLUFF-EAT-A, which produces more finished cake per pound of flour. You get a richer, moister, longer-keeping cake with ROYAL FLUFF-EAT-A.

VOIGT MILLING CO.
Grand Rapids, Mich. Telephone 85991

UNIFORM QUALITY FLOURS
PLAIN AND SELF-RISING
Low cost laboratory controlled mill grinding all types of wheat
Pancake Flour—Cake Flour—Farina—Whole Wheat Products—Prepared Biscuit Flour
CHELSEA MILLING CO., Chelsea, Mich.

Mother Hubbard
FOR QUALITY, FLAVOR AND ECONOMY
Flour Hubbard Milling Co.

ACME RYE
A HIGH QUALITY WISCONSIN RYE FLOUR
All Grades
FISHER-FALLGATTER MILLING CO.
WAUPACA WISCONSIN

TRIPLE XXX FINE GROUND
ALFALFA MEAL
Ideal for Poultry Mashes
THE DENVER ALFALFA MILLING & PRODUCTS CO. Merchants Exchange, St. Louis, Mo.
Lamar, Colo.

OATMEAL MARKETS

Toronto-Montreal: Rolled oats and oatmeal are in good demand. Mills are operating on export orders in addition to domestic business. Sales are made at the ceiling. Quotations: rolled oats $3.15 bag of 80 lbs, cotton, in mixed cars; oatmeal, in 98-lb jutes $3.85 bag, f.o.b. Toronto or Montreal.

Winnipeg: Demand for rolled oats and oatmeal is moderate and all sales apparently are for domestic account. Mills are operating part time and supplies are sufficient to meet the demand. Quotations: rolled oats, in 80-lb sacks $3.25 in the three prairie provinces; oatmeal, in 98-lb sacks, 20% over rolled oats.

Minneapolis: Rolled oats were quoted on Feb. 12 at $5 per 100 lbs bulk; 20-oz packages $2.59 case, 48-oz packages $2.82.

Western Canada Visible Grain Supply

Visible supply of grain in the western inspection division Feb. 9, 1945, and receipts and shipments during the past week, in bushels (000's omitted):

	Wheat	Durum	Oats	Barley
Fort William and Port Arthur—				
Semi-public terminals	49,593	1,957	9,165	15,190
Private terminals	..	..	36	1
Winter storage, afloat	..	..	..	122
Totals	49,593	1,957	9,201	15,314
Vancouver-New Westminster	16,615	..	221	104
Int. public and semi-public elevators	10,971	..	180	406
Churchill	1,878	..	..	..
Prince Rupert	1,097	..	..	..
Victoria	876	..	..	..
Totals	81,025	1,957	9,601	15,823
Year ago	45,671	947	8,682	8,731
Receipts during week—				
Ft. Wm.-Pt. Ar.	1,265	18	3,071	2,002
All other public and semi-public terminals, western div.	703	..	143	9
Totals	1,969	18	3,215	2,011
Shipments during week—				
Ft. Wm.-Pt. Arthur—				
Rail	223	134	865	267
All other public and semi-public terminals, western div.	369	..	72	29
Totals	591	134	938	296
TOTAL RECEIPTS Aug. 1, 1944, to Feb. 9, 1945				
Ft. Wm.-Pt. Ar.	184,875	4,905	50,484	47,456
All other public and semi-public terminals, western div.	9,872	..	1,224	1,373
TOTAL SHIPMENTS Aug. 1, 1944, to Feb. 9, 1945				
Ft. Wm.-Pt. Ar.	161,450	4,541	56,448	37,528
All other public and semi-public terminals, western div.	7,384	..	1,017	1,216

Bonded Grain in the United States

Bonded grain in the United States Feb. 3, 1945, in bushels (000's omitted):

	Wheat	Corn	Oats	Rye	Barley
Baltimore	512	..	..	..	..
Boston	1,195	..	..	..	..
Buffalo	5,342	..	255	114	..
Afloat	7,359	..	2,353	..	440
Chicago	..	..	..	..	..
Afloat	1,257	..	1,436	..	..
Duluth	19	..	225	..	250
Fort Worth	537	..	..	..	..
Lakes	..	..	..	..	..
New Orleans	1,042	..	..	..	..
New York	128	..	..	..	..
Afloat	..	..	..	..	..
Philadelphia	522	..	..	..	..
Totals	16,871	1,042	4,269	114	690
Jan. 27, 1945	17,649	..	4,578	139	696
Feb. 5, 1944	11,700	..	98	3,560	590

United States Grain Stocks

Commercial stocks of grain in store and afloat at the principal markets of the United States at the close of the week ending Feb. 3, 1945, and Feb. 5, 1944, as reported to the United States Office of Marketing Services (WFA), in bus (000's omitted):

	American		Canadian in bond	
	Feb. 3 1945	Feb. 5 1944	Feb. 3 1945	Feb. 5 1944
Wheat	133,897	120,039	25,468	17,923
Corn	19,592	19,868	...	...
Oats	13,062	13,593	4,401	226
Rye	11,116	20,517	114	4,317
Barley	27,541	15,819	690	698
Flaxseed	2,462	6,273	527	2,350
Soybeans	21,651	21,079	...	...

Stocks of United States grain in store in Canadian markets Feb. 3 (figures for corresponding date a year ago given in parentheses): wheat none (1,222,000) bus; corn 179,000 (527,000); soybeans 74,000 (27,000).

Rye Flour Output

Following is the rye flour output reported to The Northwestern Miller by mills at Chicago, Minneapolis and outside points in the Northwest, in sacks, with comparative figures for the previous weeks:

	Jan. 20	Jan. 27	Feb. 3	Feb. 10
Five mills	29,098	22,390	35,483	*31,486

*Four mills.

SUNNY KANSAS

Steady bake-shop habits; pleasant bread personality; a profitable friend . . .

That is SUNNY KANSAS as you know it, or as you will quickly learn to know it when you use it in your bakery.

★ ★

The Wichita Flour Mills Co.
5,000 Sacks Capacity 1,000,000 Bushels Storage
WICHITA : : : KANSAS

IF YOU NEED
CHEMICAL ANALYSES ★ TEST BAKES
PRODUCT RESEARCH ★ VITAMIN ASSAYS
LABORATORY AND RESEARCH DIVISION
THE W. E. LONG COMPANY
155 N. Clark Street Chicago 3, Illinois

Garland Milling Co.
Pure Soft Winter Wheat Flour
GREENSBURG, IND.

BLACK BROS. FLOUR MILLS
1863-1944
FLOUR 1,000 BBLS.
STOCK FEED 250 TONS
WYMORE • NEBRASKA

LUCKY GLUTEN FLOUR
Prompt Delivery
Uniform High Quality
FEDERAL MILL, Inc.
Lockport, N. Y.

MARKETS IN DETAIL

U. S. FLOUR MARKETS

THE SOUTHWEST

Kansas City: Sales of flour by mills in the Southwest lagged somewhat last week while most buyers and sellers attended to their delivery problems. Sales, however, reached 53% of capacity, compared with 81% the previous week and 46% a year ago.

Mills are in many cases drifting farther behind on their deliveries as the result of low manpower and shortage of cars. Some mills were forced to close down for a day last week because of the boxcar shortage.

Buyers are purchasing some fill-in cars, but some mills are forced now to fill the immediate needs only of the customers in distress. Several bakeries have curtailed production because of flour shortage and their own manpower situation.

Prices are hugging the ceiling as mills find little incentive to sell when their production schedules fall into arrears. A few buyers are becoming alarmed at the situation.

Clears are lower, slightly, because of the increased offerings of straight cars. Export business still is good to the Latin American countries.

Quotations Feb. 10: established brands of family flour $4.10@4.30, bakers short patent $3.30@3.35, standard patent $3.25@3.30, straight $3.20@3.25, high protein clears $2.65@2.80 (nominal), low protein $2@2.15.

Four mills report domestic business active, 4 fair, 6 quiet, 4 slow and 7 dull.

Oklahoma City: Flour sales averaged 78% last week, compared with 80% the previous week. Family buyers took 60% of bookings and bakers 40%. There was a slight improvement in operations, which averaged 89%, compared with 82% the previous week. Prices are unchanged. Quotations, sacks, del. Oklahoma rate points Feb. 10: hard wheat short patent flour $4@4.30; soft wheat short patent $4@4.30, standard patent $3.90@4.10, bakers short patent $3.35@3.45, bakers standard $3.25@3.35.

Omaha: Bakery buying and government lend-lease and army buying of flour appeared last week and business was in fair volume. Except for a few large orders, general business was not in excess of 60% of capacity. The bakery business continues at a high level. Cash wheat is very strong in Omaha and ceiling prices prevail for all milling wheat. There is a very moderate movement and with the boxcar situation so bad, any chance of having much change in the wheat receipts is rather small. Demand is excellent. Mills are operating at very near to full capacity and indications are that this will continue for some time. Quotations Feb. 10: family short patents $3.30@3.50, standard patents $3.15@3.30, bakery short patents $3.30@3.50, high protein clears $2.75@2.90, fancy first clears, nominally $2.20@2.50; low grade clears, nominally $2.05@2.10.

Wichita: Millers are somewhat handicapped by lack of cars. Some mills have been compelled to store flour against the day when cars will come through. Mills have been operating from 90 to 100%, indicating that the labor situation is slightly easier.

Hutchinson: Flour interest broadened last week and the volume of new business expanded. Round-lot bookings were included. Inquiry came from both bakers and jobbers. Shipping directions continue to come freely, but movement is retarded by lack of boxcars.

Salina: Demand for flour is only fair. Shipping directions are good, but boxcars are scarce.

Texas: Flour sales last week were off somewhat compared to the previous period. Family flour accounted for 15 to 25% of capacity. There was a sprinkle of export sales by mills having long established connections. Some mills may have sold as much as 40 to 50% of capacity in all. No buying by government agencies was reported. Operations continue at maximum capacity. Prices are unchanged. Quotations Feb. 10: family flour $3.90@4.15, high patent $3.65@3.90, standard bakers, ceiling $3.52, first clears, enriched $2.90@3, delivered TCP.

THE NORTHWEST

Minneapolis: New York buyers were reported to be in the market last week for small lots of flour, but general inquiry was light. Millers report a decided falling off both in inquiry and bookings, with buyers hesitant and apparently unable to make up their minds as to future needs. Considering the volume of business on mill books, this is not to be wondered at, and, with shipping conditions as they are, millers are not aggressive sellers.

Not only are bakers getting low on stocks, but retail groceries throughout the central states and the East are said to have been just about cleaned out of flour. Distributors to the grocery trade have flour bought and are clamoring for deliveries. Mills, of course, are unable to help themselves, and they say it will take weeks to fill up the holes. In the meantime, they are not pressing for new business—either family or bakery.

Bookings by northwestern mills last week were a little under 60% of capacity, compared with 96% a week earlier, and 40% a year ago.

Quotations Feb. 12: established brands family flour, enriched $4.30@4.46, high gluten bakery flours $3.54, bakery short patent $3.44; first patent $3.44, standard patent $3.34; fancy clear $3.24@3.34, first clear $3@3.10, second clear $2.70@2.90, whole wheat $3.30@3.54.

Interior mills, including Duluth: Inquiry remains indifferent with only light sales reported last week. Mills have plenty of directions, but operations are handicapped by lack of boxcars. As usual, demand for millfeed far exceeds the supply.

THE CENTRAL WEST

Chicago: Bakery buyers continued to hold off last week and only scattered, moderate-sized sales were made to them and other flour users. Shipping directions continue fair, but lack of cars has affected deliveries. Sales of family flour continue fair, but no general buying is reported. Deliveries are fair. Quotations Feb. 10: spring top patent $3.47@3.57, standard patent $3.37@3.47, first clear $3.14@3.34, second clear $2, family flour $4.41; hard winter short patent $3.46@3.57, 95% patent $3.36@3.47, first clear $2.67@3.45, soft winter short patent $3.45@4.31, standard patent $3.26@4.06, first clear $2.75@3.

St. Louis: New flour sales were considerably lighter last week, nothing in the way of large parcels being placed on the books. Buying was scattered and consisted of 1,000- to 5,000-bag lots. The usual carlot orders were rather slow. A good demand existed for clears. Offerings were small and prices held firm. The car shortage is affecting business considerably. Jobbers advise new business is very light. The trade generally have enough booked to carry them for some time. With favorable war news, they do not feel like making further commitments. Sugar requirements are very difficult to procure.

Central states mills report bookings fairly good. The baker, family and cracker trades were interested in hard and soft wheat flour, but the car shortage has had a tendency to slow down sales.

Quotations Feb. 10: soft wheat patent $3.98, cake flour $4.58, straight $3.74, family short patent $4.29, straight and 95% $4.29, first clear $3.32@3.75; hard wheat bakers patent $3.44, family short patent $3.57@3.83, straight and 95% $3.44@3.49, first clear $2.68@3.06; spring wheat patent, straight and 95% $3.44.

Toledo: It now appears that some central states mills did more business following announcement of the new subsidy Feb. 1 than was reported at the time, but it was of temporary duration. All mills have been handicapped by inability to get cars, and if this condition continues buyers will become concerned about their supplies. Sales have settled back into routine character, with many of the mills not pressing to make additional sales, but concerned about making shipments already on the books.

EASTERN STATES

Buffalo: Sales of flour are scattered and light. The trade interest at this time is more in getting flour delivered than in making new commitments, a problem that is complicated by the transportation tie-up as a result of the storm, car and labor shortages. Mills are crowded with directions. Traffic departments of the mills at this time are the nerve centers of the plants. Spring clears are firm. Quotations Feb. 10, cottons: spring first patent $3.80; standard patents $3.70, first clear $3.33; hard winter short patent $3.80, 95% patent $3.70, first clear $3.25; soft winter short patent $3.75, first clear $3.10.

New York: Although scattered sales are reported, the major attention of the trade continues to center on getting flour through to buyers. The situation, in spite of some improvement in transportation, continues to harass flour users as impediments from mill to trucking at the bakery hinder deliveries. The recent embargoes have materially reduced the railroad congestion, but it is difficult to get boxcars and brokers report that their mills in all parts of the country can get no more than 25% of their requirements. This previously was particularly true at Buffalo, where weather conditions have been critical, but eastern storms have now cut western roads' supplies by delaying the return of empties.

Some improvement is evident at metropolitan freight yards and the railroads are better able to locate cars and lighter them to terminals, when permits are available. The trucking situation is still far from satisfactory.

Slightly lower flour prices attract buyers and scattered to fair sales of spring standards are reported. A few sales of clears and Kansas standards are also reported. Quotations Feb. 10: spring high glutens $3.95, standard patents $3.55@3.70, clears $3.35@3.50; southwestern short patents $3.70@3.80, standard patents $3.50@3.60, clears $2.97@3.15; soft winter straights, Pennsylvania $3.50@3.60, Pacific coast $3.72@3.77.

Philadelphia: Flour prices are holding at previous levels. The recent double embargo caused a tight position on supplies, but there is a moderate easing in this direction and the next few days should see a loosening up in receipts. There is some bakery inquiry for spot delivery, but virtually all flour due to arrive within the near future has been contracted for and actual transactions are small. Quotations Feb. 10: spring wheat short patent $3.73@3.78, standard patent $3.63@3.68, first spring clear $3.45@3.55; hard winter short patent $3.73@3.78, 95% $3.63@3.68; soft winter straights, nearby $3.35@3.45.

Pittsburgh: Some activity was evident in flour sales the past week. Freight tie-ups were proving very disturbing to bakers and jobbers of the entire Tri-State area. Although embargoes were lifted, freight deliveries in all lines were in a terrible plight. One flour salesman who made a trip through central Pennsylvania stated flour orders on a "larger than usual scale" were placed by many bakers, but placing flour orders proved much less disturbing than getting delivery. Jobbers in the district had great difficulty in getting flour. Rolling stock of railroads and the labor situation are both below par and promise increased trouble in deliveries in this section. Flour prices on standard patent are close to ceilings. Other prices remain at last week's quotations. Clears are in fair demand, with the supply tight and prices firmer. Shipping directions are brisk.

Quotations Feb. 10: hard winter bakers short patent $3.70@3.80, straight $3.60@3.70, high gluten $3.90, first clear $3.15@3.25; spring bakers short patent $3.70@3.80, standard $3.60@3.70, high gluten $3.90, first clear $3.45@3.50; soft winter bakers cake flour $4.55@4.60, intermediate $3.85@3.92, straight $3.65@3.69; Pacific coast $3.63@3.73; family flour, advertised brands $4.35@4.71, other brands $4@4.71.

THE SOUTH

New Orleans: A little business was transacted this week in the flour trade here. Principal activity continued to be in southwestern hard wheats. There was some activity in midwestern flour. Sales in northern spring wheat and Pacific coast types are fair. Shipping directions here continue favorable. Production of cake, cracker, macaroni and bread continues good. Quotations Feb. 10: hard spring family patent $3.64, first patent $3.44, standard patent $3.34, fancy clear $3.25@3.30, first clear $3.25, second clear $3.15; hard winter family patent $3.75, bakers short patent $3.45@3.60, first clear $2.85@3.10; soft wheat short patent $4.25@4.45, straight $3.90@4.15, first clear $3.55@3.70.

Nashville: Millers and flour brokers report new business rather light. The anticipated sales on the change in the subsidy the first of the month did not develop. Sales were limited to an occasional car of patent grades for immediate or nearby shipment and forward bookings were practically nil. Outbound shipments to the merchants, jobbers and wholesalers in the South and Southeast range from slow to fairly good. Local blenders say that slowness in family flour sales seems inevitable during war times, when the majority of women are either working in war projects or giving part of their time to relief agencies. However, this condition helps the bakery business. Flour prices are about steady with a week ago.

Quotations Feb. 10: soft wheat bakers and pastry flour $3.70, high patent $4.78, extra protein content $4.85, soft wheat short patent family $5.05@5.15, standard patent $4.90@5.05, straight $4.65@4.85, clear $4.20@4.50.

PACIFIC COAST

Seattle: The flour market is unchanged. New business is very nominal, as mills in this territory all have heavy bookings with the government and lend-lease. In view of the good demand from all other outlets they are not inclined to shade prices or press sales at this time. Mills are operating at capacity with enough business in sight to keep them busy for at least the next 60 to 90 days. Quotations, basis carlots, f.o.b. Seattle or Tacoma, Feb. 10: family patent, enriched, 50's $4.12; bakery pastry, 100's $2.98; bluestem, 100's $3.33; Montana hard wheat, 100's $3.59.

Portland: New flour bookings are slow in the Pacific Northwest. Mills are not receiving inquiries from the Middle West, due to the break in the wheat markets, and local buyers are not prone to take hold. The embargo on movement of cars east of the Mississippi river had its effect on the slowing down of inquiries from east of Chicago. Shipments have been held back, and this has slowed down everything generally. Mills have sufficient backlog for the next 60 days, and figure the government will be in the market for more flour by that time.

Quotations Feb. 10: all Montana $3.60, high gluten $3.60, bluestem bakers $3.37, bluestem topping $3.30, cake $3.80, pastry $3.08, pie $3.08, fancy hard wheat clears $3.30, whole wheat 100% $3.30, graham $3, cracked wheat $3.

CANADIAN MARKETS

Toronto-Montreal: Spring wheat flour operations are curtailed by difficulties of transportation. The inadequate supply of boxcars is slowing up movement out of the mill and most plants are plugged up with flour. No more export orders can be taken until the situation improves. Completion of present contracts has been postponed by the scarcity of transportation facilities. Prices are at ceiling levels in the domestic market and the export price for United Kingdom is also stabilized. Quotations Feb. 10: top patents $5.05 bbl, seconds $4.40, bakers $4.30, in 98's cotton, mixed cars, track, Toronto Montreal freights, add 10c extra where cartage is performed. For export, government regulation flour $9.45 per 280 lbs, f.a.s. winter ports, February-March-April seaboard.

Winter wheat flour trade is quiet. Most mills have enough business on hand to keep running fairly steadily if they have sufficient wheat to fill the orders. Some are short of grain and find it difficult under present road conditions to get fresh supplies. Domestic demand is moderate, but there has been a good export inquiry. Ceilings prevail. Quotations Feb. 10: $5.50 bbl, in secondhand cottons, Montreal freights; for export $6.25 bbl, in cotton bags, Canadian seaboard, plus equalization fee of 75c bbl.

Winter wheat is scarce. Country roads are impassable and wheat deliveries are at a standstill. It is believed that there are fair quantities still on farms which will be available when road conditions improve. The price is the ceiling. Quota-

A SUMMARY OF FLOUR QUOTATIONS IN LEADING MARKETS

Week-end flour quotations, per sack (cwt), packed in 100 lbs. (Canadian quotations per bbl of 196 lbs.) All quotations on basis of carload lots, prompt delivery.

	Chicago	Minneapolis	Kansas City	St. Louis	Buffalo	††New York	Baltimore	Philadelphia	Boston	Cleveland	†Nashville
Spring first patent	$3.47@ 3.57	$....@ 3.44	$....@....	$....@ 3.44	$....@ 3.80	$....@ 3.95	$....@....	$3.73@ 3.78	$3.75@ 3.82	$3.70@ 3.80	$....@....
Spring standard patent	3.37@ 3.47	....@ 3.34	....@....	....@ 3.44	....@ 3.70	3.55@ 3.70	....@....	3.63@ 3.68	3.65@ 3.72	3.60@ 3.70	....@....
Spring first clear	3.14@ 3.34	3.00@ 3.10	....@....	....@....	....@ 3.33	3.35@ 3.50	....@....	3.45@ 3.55	3.40@ 3.50	3.20@ 3.40	....@....
Hard winter short patent	3.46@ 3.57	....@....	3.30@ 3.35	....@ 3.44	....@ 3.80	3.70@ 3.80	....@....	3.73@ 3.78	3.75@ 3.82	3.50@ 3.60	....@....
Hard winter 95% patent	3.36@ 3.47	....@....	3.25@ 3.30	3.44@ 3.49	....@ 3.70	3.50@ 3.60	....@....	3.63@ 3.68	3.65@ 3.72	3.40@ 3.50	....@....
Hard winter first clear	2.67@ 3.45	....@....	3.20@ 3.25	2.68@ 3.06	....@ 3.25	2.97@ 3.15	....@....	....@....	....@....	3.00@ 3.20	....@....
Soft winter short patent	3.45@ 4.31	....@....	....@....	....@ 3.98	....@ 3.75	....@....	....@....	....@....	3.80@ 3.85	4.30@ 4.55	....@ 4.78
Soft winter straight	3.26@ 4.06	....@....	....@....	....@ 3.74	....@....	3.50@ 3.60	*....@....	*3.35@ 3.45	3.50@ 3.55	3.50@ 3.70	4.65@ 4.85
Soft winter straight (Pac. sts.)	....@....	....@....	....@....	....@....	....@....	3.72@ 3.77	....@....	....@....	....@....	....@....	....@....
Soft winter first clear	2.75@ 3.00	....@....	....@....	3.32@ 3.75	....@ 3.10	....@....	....@....	....@....	3.25@ 3.40	3.00@ 3.30	4.20@ 4.50
Rye flour, white	3.18@ 3.31	3.30@ 3.40	....@....	....@ 3.69	....@ 3.55	3.41@ 3.55	....@....	3.42@ 3.52	....@....	3.15@ 3.25	....@....
Rye flour, dark	2.74@ 3.05	2.95@ 2.98	....@....	....@ 3.19	....@ 3.05	....@....	....@....	....@....	....@....	2.70@ 3.00	....@....
Semolina, No. 1	....@ 3.75	....@....	....@....	....@ 3.99	....@ 3.98	....@ 4.03	....@....	....@ 4.03	....@....	....@....	....@....

	Seattle	S. Francisco	Standard patent—	Seattle	San Francisco		Toronto	**Winnipeg		Toronto	**Winnipeg
Family patent, 50's	$....@ 4.12	$....@....	Dakota	$....@....	$....@....	Spring top patent†‡	$....@ 5.05	$....@....	Spring exports‡	$9.45	....
Soft winter straight	....@....	....@....	Montana, 100's	....@ 3.59	....@....	Spring second patent†	....@ 4.40	....@....	Ontario 90% patents‡	5.50	....
Pastry, 100's	....@ 2.98	....@....				Spring first clear†...	....@ 3.30	....@....			

*Includes nearby straights. †Nashville prices basis f.o.b. Ohio River points for soft winter wheat flour. **In cottons, Fort William basis. ‡Second-hand cottons. †98-lb cottons. §280-lb cottons. ††High glutens.

tions Feb. 10: $1.26 bu, Montreal freights, which is equivalent to $1.12@1.14 bu, f.o.b. shipping points, according to freights.

Winnipeg: Export trade in Canadian flour last week was restricted to small amounts worked to the West Indies. There was no suggestion of any business to the United Kingdom or other overseas destinations. Domestic demand continues and supplies are moving freely. All mills are operating to capacity and there appears to be no let-up in sight. Quotations Feb. 10: top patent springs for delivery between Fort William and the British Columbia boundary, $5.30, cottons; second patents $4.80; second patents to bakers $4.60.

Vancouver: No export trade has yet developed here and business continues confined to regular orders for the baking trade, coupled with limited store demand. The export picture continues cloudy, although commitments are understood to have been made for a substantial movement of sacked wheat from this port for British Empire countries and some flour may be included in these shipments.

In the domestic hard wheat flour trade bakery orders are holding active and steady, but there is no improvement in store sales. Prices are unchanged, cash car prices on the basis of cotton 98's being $5.40 for first patents, $5 for bakers patents and $4.90 for Vitamin B, all prices based on Feb. 10.

Soft wheat flour from Ontario continues to find a fair demand with price to the trade firm at $7.50.

MILLFEED MARKETS

Minneapolis: Curtailed operations, due to the car shortage, naturally have emphasized the scarcity of millfeed. The temporary embargo against shipments to the East enabled northwestern mills to allocate a little more of their production to local buyers in their respective areas, but they did not make enough to satisfy even this demand. Now that the embargo has been lifted, mills want to take care of customers elsewhere, but the car situation is such that they are getting farther and farther behind on deliveries. Jobbers are able to pick up an occasional car, but they are few and far between. With boxcars at a premium, more feed is moving out by trucks than normally. Mixed-car demand also is heavy, so that most mills have difficulty in accumulating straight cars of millfeed. It will be some time, millers say, before the situation is again anything like normal. Ceiling: $37.75.

Oklahoma City: Demand continues to exceed supply. Quotations, burlaps, carloads for southern deliveries: bran, mill run and shorts $1.95 cwt; for northern deliveries: $1.80.

Omaha: Millfeed production is holding up very well and with prospects of continuing so for some time, larger part of the demand may be satisfied. As yet, however, the demand from all directions is greatly in excess of the supply. Recent cool and windy weather has been favorable for drying wet corn in this territory. Hominy feed has moved up $1 ton in the last few days.

Wichita: Demand from feeders and feed mixers for millfeeds is so strong that it is impossible to keep abreast of orders. Quotations are unchanged at the ceiling and are reported, basis Kansas City, at $36.50 ton for bran and shorts.

Hutchinson: Millfeed demand is far in excess of supply and prices for all deliveries remain at ceilings.

Salina: Demand is exceptionally good, with the trend steady and supplies insufficient to take care of trade requirements. Bran and shorts continue to sell at ceiling levels.

Fort Worth: The supply situation continues as tight as ever. Occasional cars of bran offered are working at full ceiling, but no carlots of shorts are available. Quotations, ceiling.

Toledo: Millfeed is still selling readily at the ceiling levels of $42.35 ton, f.o.b. Toledo, with demand in excess of supply and production showing tendency to fall off.

Buffalo: The feed situation is serious because of the breakdown caused by the unprecedented storm which tied up transportation. Output still is curtailed for the same cause. In the last few days, due to remedial measures taken by the state, some relief has been secured, but there is a great demand from the farms and distributive channels for more feed at once to save the animals. Quotations: all varieties $41.55 straight carloads, f.o.b. Buffalo.

Philadelphia: Demand is good, the trend is firm and supplies are limited. Quotations: std. bran, pure spring, hard winter, soft winter, std. midds., flour and red dog, all $44.84@45.34 ton.

Pittsburgh: Bran, standard middlings, red dog buyers all over the district are searching for feeds for their customers. Corn, barley and oats have firmed in price and supplies are much below the demand. Clears are scarce too. Freight tie-ups are very bad throughout the entire district. Embargoes have been lifted but freight deliveries are slow and the millfeeds picture in the Tri-State district remains gloomy.

Nashville: Demand is heavier for millfeed, due to colder weather. Few offerings are made as the majority of mills are either selling their entire production at their mill doors, or in mixed cars. Local dealers indicate that it is difficult to secure feed in large quantities. Prices continue at the ceilings. Bran and shorts both quoted $43.30@44.30 ton.

Seattle: The supply is limited; $36.50 ton.

Portland: Mill run, bran, midds., shorts $36.50 ton.

Ogden: Business continued brisk last week, with trade stimulated by a snowstorm and colder weather. Plants are keeping up with commitments, and report a lot of government as well as local business well into April. Mills continue to operate at capacity. Quotations: red bran and mill run, blended, white and midds. $36.30, carload lots, f.o.b. Ogden. Denver prices: red bran and mill run, blended, white and midds. $38 ton, ceiling. California prices: red bran and mill run, blended, white and midds. $42.08, carlots, f.o.b. San Francisco, with Los Angeles prices up $1, ceiling.

Toronto-Montreal: Mills cannot begin to take care of the inquiry for millfeed. Supplies are tighter than ever now that the movement of feeding grains has slowed up. Prices remain at the ceiling. Quotations: domestic ceiling, bran $29, shorts $30, midds. $33 ton, net cash terms, bags included, mixed or straight cars, Montreal freight rates.

Winnipeg: Demand for all millfeeds continues keen and practically all supplies from western mills are moving to eastern Canada. Sales in western Canada are insignificant. The output of millfeeds is substantial and all supplies are moving freely. Quotations: Manitoba and Saskatchewan bran $28, shorts $29; Alberta bran $25.50, shorts $26.50; small lots ex-country elevators and warehouses $3 extra.

Vancouver: Domestic demand continues beyond all expectations and will likely continue as long as millfeed bears the same cost relationship with ordinary feeding grains as it currently does. All dealers are rationing sales to customers, but even with this method they are unable to cope with demands. In addition, western mills shutting down for freeze-outs on the prairies have slowed up somewhat in their deliveries. Cash car quotations are, bran $29.80, shorts $30.80, midds. $33.80.

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SALESMAN WANTED — TRAVELING flour broker for eastern Texas-Louisiana territory with expenses advanced needed by mill already serving that area with excellent family flour prospects there. Address 7188, The Northwestern Miller, 612 Board of Trade Bldg., Kansas City 6, Mo.

TEXAS MILL, 1,250 CWT DAILY CApacity, seeks sales manager, experienced in handling and developing bakery and family trade. Prefer man 38 to 43, or younger if draft exempt, with following in states of Texas, Louisiana and the Southeast. Must be honest, sober, dependable, reliable, aggressive, industrious, with pleasing personality—a good telephone salesman, producing personally as well as through sales force directed. Permanent job, excellent opportunity for right man. Address 7165, The Northwestern Miller, 612 Board of Trade Bldg., Kansas City 6, Mo.

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N. & M. CHILLS, 10x30; NO. 4 ALLIS Reels, No. 28 Great Western sifters and parts for them. 9x24 Allis roller mills, No. 7 Niagara Upright bran duster; No. 4 Allis Upright bran duster. Receiving separators. Richardson Co., 1901 2nd St. N., Minneapolis, Minn.

MACHINERY WANTED

WANTED—BRIGHTWOOD BOX MACHINE — Pneumatic scale packaging machine; two flour blenders. Address 4970, The Northwestern Miller, Minneapolis 2, Minn.

FLOUR BLENDING MACHINERY WANTed—One 10-bbl flour mixer; one small package flour packer; one 60- to 75-bbl sifter; one 75-bbl Entoleter; one 10 H.P. gear head motor. F. D. Lowery, Box 110, Meridian, Miss.

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Milk Solids

(Continued from page 16.)

and the simultaneous use of 6% nonfat milk solids in suitable types of bread.

It is difficult for nutrition experts, with the nation's welfare at heart, to discern any incompatibility or any competition between the flour and bread enrichment program and the continuing use of nonfat milk solids in bakery products. No evidence was produced to show that enrichment has caused less use of milk in bread. Neither the board's representatives nor those of the milling and baking fields foresaw any likelihood of decline in the use of milk solids in bakery goods because the addition of milk solids is not specified in the model state bill. That model is based on the proposed standard and definition resulting from a thorough public hearing under the auspices of the Food and Drug Administration.

In conclusion Dr. Boudreau, chairman of the Food and Nutrition Board, approved the suggestion of Dr. Krauss, chairman of the committee on milk, for study and report on the questions raised at the meeting such as better standardization of nonfat milk solids, and the greater use of these products among the population. The board and its committees intend to examine further their position and in the meantime recommend both flour and bread enrichment and the wide use of milk solids including dry milk products for regular household purposes. Dr. Boudreau urged all participants to exert their efforts in those directions, and asked representatives of the dairy and bakery industries to send to the board any further observations they might care to make, bearing in mind that the chief concern of the board is the nutrition of the American people as a whole.

In addition to Dr. Boudreau, the Food and Nutrition Board and its committees on milk and on cereals were represented by Russell M. Wilder, R. R. Williams, E. V. McCollum, W. E. Krauss, L. A. Maynard, F. C. Bing, G. C. Thomas, W. H. Sebrell, E. M. Nelson, Hugo Sommer and F. L. Gunderson. R. C. Sherwood represented the War Food Administration. Associated with Mr. Kinzer were Charles Fistere, secretary of the Dairy Industry Committee, Roud McCann, Victor Marx, C. M. Peterson, C. A. McDuffee, W. H. Gurlee, W. A. Wentworth, Col. B. F. Castle, Harry Leonard and R. C. Hibben. The National Co-operative Milk Producers' Federation was represented by C. W. Holman, R. R. Gockley and B. F. Beach. John McCarthy, president of the American Bakers Association, Oscar Skovholt, Quality Bakers of America, and Charles Hoffman, Ward Baking Co., in addition to Dr. F. C. Bing of the American Institute of Baking, expressed the views of the bakers. Mr. Skovholt and Mr. Hoffman are members of the scientific advisory committee of the institute.

——BREAD IS THE STAFF OF LIFE——

INCREASING STORAGE SPACE

Kansas City, Mo.—New storage facilities for the Brunswick, Mo., plant of the W. J. Small Co. are being built by Jones-Hettelsater Construction Co., Kansas City, it was announced recently. Construction started Feb. 12. The warehouse, which will include blending facilities of modern design, is for the dehydrated alfalfa meal produced by the Small company at this and other locations. It will be a fireproof building and the conveying system will include a belt conveyor to the cars for efficient loading. The building will be 220 by 186 feet, replacing the warehouse destroyed by fire some months ago.

——BREAD IS THE STAFF OF LIFE——

CONFERENCE ON WHEAT

Manhattan, Kansas.—Agricultural scientists from the midwestern universities and colleges gathered at Kansas State College the first three days of this week to discuss hard winter wheat improvement from the standpoint of breeding, agronomic characteristics, insect and disease control and other factors. Milton S. Eisenhower, president of Kansas State College, addressed the group at a dinner Feb. 13.

——BREAD IS THE STAFF OF LIFE——

ON INSURANCE BOARD

Kansas City, Mo.—Frank A. Theis, president of Simonds-Shields-Theis Grain Co., and head of the Kansas City Chamber of Commerce, has been elected to the board of directors of the Kansas City Life Insurance Co.

RYE PRODUCTS

Minneapolis: Inquiry is indifferent and buying is limited to small lots for nearby delivery. Lack of stability in grain futures is possibly one reason why the trade does not display more confidence. Spot rye is becoming increasingly scarce. Only nine cars were delivered in Minneapolis last week, and No. 2 commands a premium of 8@11c bu over the May future. Quotations on flour necessarily have to be held firmly. Pure white rye flour $3.30@3.40 cwt, in cottons, f.o.b. Minneapolis, pure medium $3.20@3.30, pure dark $2.95@3.08.

Philadelphia: A stronger tone developed in rye flour last week, due to a slightly better demand, and prices showed an upward trend. At revised figures the undertone was barely steady, with offerings more liberal; white patent $3.42@3.52.

Pittsburgh: Rye flour sales were dull the past week. Prices remain stationary. Little interest is shown in quotations. Shipping directions are good, but deliveries are very slow. Rye flour, fancy white $3.45@3.50, medium $3.35@3.40.

New York: Only scattered rye sales are reported as supplies are difficult to obtain. Quotations Feb. 10: pure white patents $3.41@3.55.

Buffalo: Demand is moderate. Supplies are adequate, and the trend is firm. Quotations, cottons: white $3.55, medium $3.45, dark $3.05.

St. Louis: Prices declined 2c last week. Sales and shipping instructions were fair. Pure white flour $3.69, medium $3.59, dark $3.19, rye meal $3.44.

Chicago: No change occurred in the rye flour market last week and business was confined to scattered small sales. Directions were fairly free. White patent rye $3.18@3.31, medium $3.08@3.21, dark $2.71@3.05.

GRAIN FUTURES—CLOSING PRICES

Closing prices of grain futures at leading markets, in cents per bushel:

WHEAT

	Minneapolis		Chicago		Kansas City		Seattle		Duluth	
	May	July	May	July	May	July	May	July	May	July
Feb. 6	156	152	163⅜	155⅝	155⅞	148¾	155	....	160	....
Feb. 7	155½	151½	163⅜	155½	155½	148¼	155	....	160	....
Feb. 8	153½	149¼	161⅝	153¼	153⅜	146⅛	155	....	160	....
Feb. 9	152⅝	148¼	160⅞	152¼	152⅝	145	155	....	160	....
Feb. 10	152⅜	148	160⅜	152¾	152⅝	145	155	....	160	....
Feb. 12				HOLIDAY						

CORN — OATS

	Minneapolis		Chicago		Kansas City		Chicago		Minneapolis	
	May	July	May	July	May	July	May	July	May	July
Feb. 6	....	....	112¾	111⅝	108⅝	....	68⅞	63½	65⅜	60¼
Feb. 7	....	....	113¼	111⅞	109⅛	....	69½	63¾	65½	61
Feb. 8	....	....	111⅞	110⅛	107⅝	....	67	61⅜	62¾	58
Feb. 9	....	....	111¼	109¾	107¼	....	66⅜	60¾	62½	57¼
Feb. 10	....	....	111⅛	110⅛	107	....	66¼	60⅞	62¼	57⅛
Feb. 12					HOLIDAY					

RYE — FLAXSEED — BARLEY

	Chicago		Minneapolis		Minneapolis		Duluth		Minneapolis	
	May	July	May	July	May	July	May	July	May	July
Feb. 6	115	112	114⅛	111⅜	310	....	310	....	107	....
Feb. 7	115¼	112⅛	114⅜	111⅜	310	....	310	....	107	....
Feb. 8	112⅛	108⅝	111⅛	108⅜	310	....	310	....	107	....
Feb. 9	111	107⅞	110⅛	107¼	310	....	310	....	107	....
Feb. 10	111⅜	108⅛	110⅝	107⅛	310	....	310	....	107	....
Feb. 12					HOLIDAY					

UNITED STATES VISIBLE GRAIN SUPPLY

Visible supply of grain in the United States, as compiled by the secretary of the Chicago Board of Trade, in bushels (000's omitted) of date Feb. 3, and corresponding date of a year ago:

	Wheat		Corn		Oats		Rye		Barley	
	1945	1944	1945	1944	1945	1944	1945	1944	1945	1944
Baltimore	4,077	3,531	722	30	15	32	55	86	3	3
Buffalo	8,396	6,122	313	597	4,631	3,729	547	3,266	1,075	948
Afloat	3,178	2,116	..	..	..	..	..	..	..	..
Chicago	3,745	5,472	4,753	4,353	1,270	1,083	8,204	9,458	1,644	839
Afloat	656	..	..	..	..	..	70	..	..	..
Duluth	11,138	18,862	738	20	4,261	1,315	445	886	3,089	830
Fort Worth	10,730	7,649	198	434	134	110	43	38	86	26
Galveston	2,072	3,066	..	..	..	..	..	..	..	..
Hutchinson	8,194	6,437	..	..	..	..	..	..	..	..
Indianapolis	894	1,505	1,168	954	75	164	30	82	..	..
Kansas City	23,868	13,175	2,441	3,032	44	228	280	790	1,049	96
Milwaukee	652	1,340	91	35	8	11	..	60	3,773	4,313
Minneapolis	13,841	21,517	1,971	981	1,053	2,573	1,185	4,712	7,112	4,722
New Orleans	586	1,436	83	218	50	66	..	..	..	39
New York	536	703	5	25	..	24	1	1	1	..
Omaha	8,186	5,110	2,288	3,206	233	1,024	18	345	967	123
Peoria	4	396	486	304	..	..	..	..	130	250
Philadelphia	1,431	1,374	30	280	12	44	39	83	..	5
St. Louis	2,693	1,732	1,161	1,105	138	281	39	47	192	271
Sioux City	443	444	380	752	30	170	4	47	8	13
St. Joseph	2,867	2,780	1,178	2,097	109	358	15	4	98	44
Wichita	5,045	1,771	15	10	3	23	..	..	168	10
Canals	..	..	..	..	..	..	..	..	..	..
Lakes	..	..	..	..	..	..	..	..	..	..
Totals	113,232	106,583	18,021	18,433	12,066	11,235	10,975	19,905	24,395	12,532

SUMMARY OF MILLFEED QUOTATIONS

Week-end millfeed quotations, summarized from the market reviews, are based on carload lots, prompt delivery, per ton, packed in 100-lb sacks, f.o.b. at indicated points. These prices are ceiling prices. Where a range is given the low represents the mill ceiling and the high the jobbers' ceiling; the single quotations are mill ceilings:

	Chicago	Minneapolis	Kansas City	St. Louis	Buffalo
Spring bran	$39.80@40.80	$....@37.75	$....@....	$....@....	$....@41.55
Hard winter bran	39.80@40.80	....@....	36.50@37.00	38.97@39.47	....@....
Soft winter bran	....@....	....@....	....@....	....@....	....@....
Standard middlings*	39.80@40.30	....@37.75	....@....	38.97@39.47	....@41.55
Flour middlings†	39.80@40.30	....@37.75	36.50@37.00	38.97@39.47	....@41.55
Red dog	39.80@40.30	....@37.75	....@....	....@....	....@41.55

	Baltimore	Philadelphia	Boston	Cleveland	Nashville
Spring bran	$44.64@45.14	$44.84@45.34	$45.67@46.17	$....@42.99	$....@....
Hard winter bran	44.64@45.14	44.84@45.34	....@....	....@....	....@....
Soft winter bran	....@....	....@....	....@....	....@....	43.30@44.30
Standard middlings*	44.64@45.14	44.84@45.34	45.67@46.17	....@42.99	....@....
Flour middlings†	44.64@45.14	44.84@45.34	45.67@46.17	....@42.99	43.30@44.30
Red dog	44.64@45.14	44.84@45.34	45.07@46.17	....@42.99	....@....

	Spring bran	Shorts	Middlings
Toronto	$....@29.00	$....@30.00	$....@33.00
‡Winnipeg	....@28.00	....@29.00	....@....

*Brown shorts. †Gray shorts. ‡Fort William basis.

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We'll Undertake to be of Real Help to You—Now

WHATEVER commodity you may want to buy on a spot basis, it is more than likely that we can find a seller if one exists. Here's why:

Through our 88 offices located in all parts of the country, our Commodity Department keeps a constant check on sources of supply. Further, we are constantly bringing buyer and seller together—and thus are conversant with specific instances in which staples have been made available to buyers for immediate use.

Why not let us look over your requirements? If you will tell us what you want, we can either help get it at regular brokerage rates—or tell you the market situation at no cost to you.

The same type of cooperation is, of course, offered to sellers.

Just address our Commodity Department—'phone if your need is urgent—and we'll swing into action for you immediately.

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Brokers in Commodities and Securities

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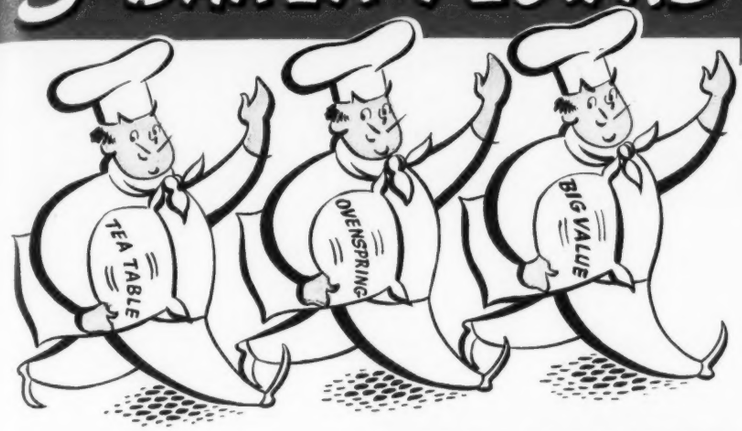

that give *consistent quality for greater profits!*

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THE WEBER FLOUR MILLS CO.
SALINA, KANSAS

PAUL UHLMANN, President — RICHARD UHLMANN, Vice President — JACK A. BENJAMIN, Secretary-Treasurer

UHLMANN GRAIN COMPANY

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OPERATING

KATY *and* WABASH ELEVATORS

Total Capacity 7,200,000 Bushels

Members of the following Exchanges:
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New York Produce Exchange
Winnipeg Grain Exchange
Duluth Board of Trade
Fort Worth Grain and Cotton Exchange
New York Rubber Exchange
New York Coffee and Sugar Exchange
New York Cotton Exchange
New York Cocoa Exchange

OFFICES:
New York City
Chicago, Ill.
Kansas City, Mo.
Enid, Okla.
Fort Worth, Texas
Amarillo, Texas

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POLAR BEAR FLOUR

Is Habit Forming

Once you use it, you probably will keep right on.

FOUNDED BY
ANDREW J. HUNT-1899

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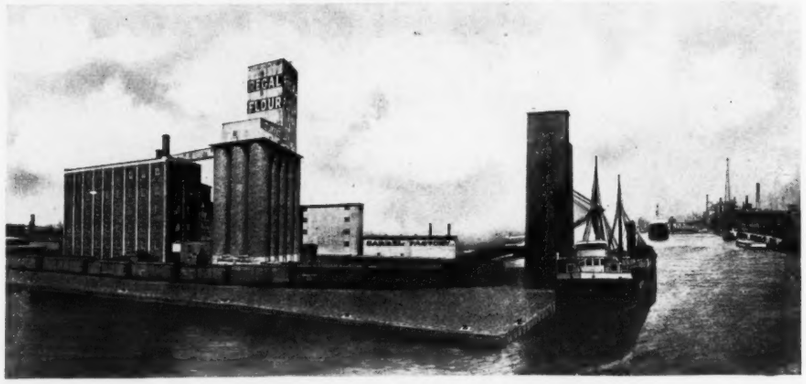
The St. Lawrence Flour Mills Co., Ltd.

MONTREAL • CANADA



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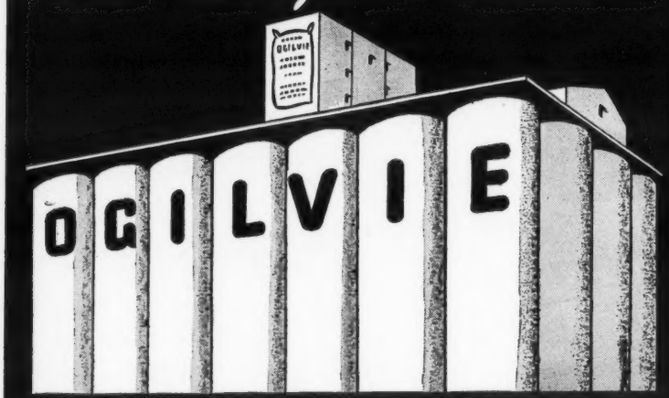
Hard Wheat Flours

"Regal"
"Fleur de Lis"
"National"
"Daily Bread"
"Citadel"

Quality uniformly maintained for over 25 years

BY APPOINTMENT TO HIS LATE MAJESTY KING GEORGE V.

Canada's Oldest and Largest Millers



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Flour	*Cereals*
"ROYAL HOUSEHOLD"	"OGILVIE OATS"
"GLENORA"	"WHEAT HEARTS"
"FAMOUS"	"OGILVIE
"BUFFALO"	BLENDIES"

THE OGILVIE FLOUR MILLS COMPANY, LIMITED

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CABLE ADDRESS: OGILVIE, MONTREAL. ALL CODES USED.

LAKESIDE MILLING COMPANY, Ltd.

"BLOSSOM *of* CANADA" "YORK" "NORDIC"

Cable Address: LAKESIDE TORONTO, CANADA

WESTERN CANADA FLOUR MILLS COMPANY LIMITED

CABLE: LAKURON TORONTO, CANADA

SPECIALISTS IN MILLING

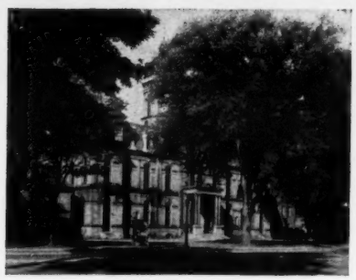
All Western Canada Hard Wheat Flours

PURITY • THREE STARS
CANADA CREAM • STERLING

GREAT WEST
BATTLE
MAITLAND
HURON

UNIFORM QUALITY GUARANTEED

FLOUR MILLING CAPACITY 9500 BBLS DAILY • ROLLED OATS AND OATMEAL 400 BBLS DAILY



THE PROVINCE OF NEW BRUNSWICK

At the back of Parliament Square, Fredericton, overlooking the St. John River, stand the Parliament Buildings of the Province of New Brunswick.

New Brunswick, nature's vacationland of Eastern Canada, embraces some 28,000 square miles of rolling hills and wide valleys, rich in forest land and productive fields. Beautiful rivers and innumerable lakes, vast woodlands abounding in game and waterways teeming with salmon and trout, make it a sportsman's paradise. Half a million residents, of whom almost 100,000 live in the three cities of Saint John, Moncton and Fredericton, are industrious, kindly, sympathetic, trustworthy and patriotic.

The Province and its people are proud of their historic past and their wartime present. Per capita, the contribution of New Brunswick in men, money, industry and farming, is high among the provinces of Canada.

JUTE BAGS COTTON

OLDEST ESTABLISHED MANUFACTURERS OF

JUTE **BAGS** COTTON

IN CANADA

Factories—MONTREAL - TORONTO

The CANADIAN BAG CO., Limited

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QUALITY UNIFORMLY MAINTAINED SINCE 1887

Lake of the Woods Milling Co., Limited

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Montreal

ALL
CABLE CODES
USED

Makers of CANADIAN HARD SPRING WHEAT *Flour*

Owning and Operating
Wheat-Receiving Elevators in Manitoba, Saskatchewan and Alberta

Mills at
Brantford, Keewatin, Medicine Hat

HEAD OFFICE: MONTREAL

WESTERN OFFICE: WINNIPEG

CHOICEST CANADIAN *Hard Spring Wheat*

and perfect milling facilities have placed our products in the van.

BRANDS

"VICTORY" - "PRAIRIE BLOSSOM"
"WOODLAND" - - "HOMELAND"

THE DOMINION FLOUR MILLS, LTD.

Cable Address: "DOMFLOUR" MONTREAL, CANADA

CANADA'S LARGEST FLOUR EXPORTERS

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PORT COLBORNE MILLS—CAPACITY 12,000 BBLS. DAILY

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MILLS AT
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Export Flour INSURANCE
"All Risks"
Special Service to Flour Mills on Export and Domestic Ocean and Lake Insurance and Transportation
Thirty-Five Years' Experience in Export Flour Handling
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CANADIAN HARD SPRING WHEAT
529 Elevators in Manitoba, Saskatchewan and Alberta.
UNITED GRAIN GROWERS, LTD.
Winnipeg, Manitoba

MISSOURI MILLS PROTEST STATE LICENSE PROPOSAL

Missouri millers are protesting against another food manufacturers' license bill which has been introduced into the Missouri legislature. The measure is House Bill 64. The proposal would require special labeling of goods sold in Missouri which would include the license number of the manufacturer.

—BREAD IS THE STAFF OF LIFE—

NEW DURUM VARIETY TESTED

Fargo, N. D.—Carleton, a new rust resistant durum variety developed cooperatively by the North Dakota Agricultural Experiment Station and the Division of Cereal Crops, U. S. Department of Agriculture, has been found to be equal to Mindum durum in most respects, after three years of testing by Manitoba durum growers. Carleton is superior to Mindum in resistance to stem rust and strength of straw and equal or slightly superior to Mindum in macaroni quality. Carleton was released to North Dakota farmers in 1943.

—BREAD IS THE STAFF OF LIFE—

NEW BALTIMORE FIRM

Baltimore, Md.—George S. Rairigh recently announced the formation of his own organization which will operate under the name of the Maryland Feed Co. For the past five years Mr. Rairigh has been vice president and sales manager of the Atlantic Supply Co., Baltimore, and is well acquainted in the eastern and midwestern sections of the country. The new company plans to act in the capacity of distributor and broker with headquarters at 105 National Marine Bank Bldg., Baltimore.

SULLIVAN & KENNEDY
Members: Toronto Board of Trade
Winnipeg Grain Exchange
Exporters
Flour. Feed. Seed Grain. Screenings.
Our Specialty: Alfalfa Meal
TORONTO 1, CANADA

CEREAL CUTTERS
Kipp-Kelly Rotary Granulators
Standard the world over for cutting small grains, wheat, hulled oats, etc.
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Buy and Sell Through
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THE NORTHWESTERN MILLER

GREAT STAR FLOUR MILLS, Ltd.
Successors to Wolverton Flour Mills Co., Ltd.
Canadian Spring and Winter Wheat Flour
"SILVERKING" "GREAT STAR" "WOLF" "KEYSTONE"
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Since 1857
James Richardson & Sons
LIMITED
Grain Merchants Shippers and Exporters
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Export Offices - MONTREAL and VANCOUVER
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IT'S IN THE RECORD
with
Robin Hood FLOUR
Laboratory Control
Uniformity
Performance
CANADIAN SPRING WHEAT FLOUR
ROLLED OATS
OATMEAL
Robin Hood Flour Mills Limited
Mills and Sales Offices: VANCOUVER · CALGARY · MOOSE JAW · SASKATOON
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HIGHEST QUALITY FLOUR
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ARROW PROTEIN CONCENTRATES
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ARMY E NAVY
Leaders in Domestic Quality Trade
Direct Exporters
HOUSTON MILLING CO.
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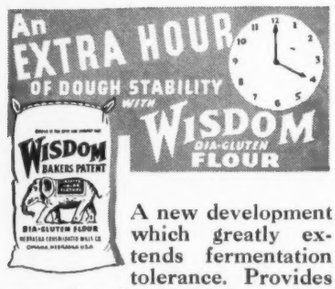
La Grange Flours . . .

whether plain or enriched, remain the same high standard, dependable flours that have characterized the products of La Grange Mills over the half century and more of their operation.

This quality pattern is not an accident but the result of painstaking care in wheat selection and careful milling.

You can depend on LA GRANGE FLOURS

LA GRANGE MILLS RED WING, MINNESOTA



A new development which greatly extends fermentation tolerance. Provides more time for "cutting over" or giving dough extra punches. If you want a flour which will stand abuse, write or wire

NEBRASKA CONSOLIDATED MILLS COMPANY
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WHITEGOLD
(Standard Patent)
BIRCHMONT
(Short Patent)
ST. CLOUD MILLING CO.
Mills at ST. CLOUD, MINN. Sales Office MINNEAPOLIS

The Williams Bros. Co.
Merchant Millers KENT, OHIO, U. S. A.
Specialists Ohio Winter Wheat Flour
All our wheat is grown on "Western Reserve" and bought from the growers at elevators we own and operate.

"OLD SQUIRE"
Always is good flour. Pays no attention to ups and downs and this and that.
Just always GOOD FLOUR
Moore-Lowry Flour Mills Co.
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FINGER LAKES AND HUDSON FLOUR MILLS, Inc.
Geneva, N. Y.
WHEAT FLOUR GENEVA, N. Y. *Mills At* RYE FLOUR TROY, N. Y.

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Line country houses in five states
Terminal houses at Kansas City and St. Joseph
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MILLERS OF
High Grade Soft Winter Wheat Flour
Plain and Selfrising
LIGONIER, IND. NORFOLK, VA.

"RUSSELL'S BEST"
"AMERICAN SPECIAL"
Our mill is located in the high protein wheat district of central western Kansas, and secures most of its wheat directly from growers.
RUSSELL MILLING CO., Russell, Kansas

GRIST FOR GRINS

Three Minneapolis men, invited by a South Dakota merchant, whom we will call George, to come out for a week-end of pheasant shooting, found, as they started out for the first day's hunt, that all the farms were posted. This did not seem to worry their host, who drove up to a farmhouse, got out of the car and went to the tractor shed to interview the farmer. He returned shortly with the information that they had been given permission to hunt on this land.

They drove down the lane and entered a pasture where George suggested they leave the car and go afoot through the adjacent cornfield.

Leaning against the pasture fence stood an old, dejected-looking horse. Without warning, George lifted his gun and shot the animal through the head. His companions, thunderstruck, began to remonstrate with him for killing the property of a farmer who had been good enough to grant them hunting privileges, but all George said was, "Now I am satisfied. I never shot a horse before, I have always wanted to know what it would feel like to shoot a horse." He reflected a moment, and added, "I never shot a man, either—"

One of the hunters, developing a sudden thirst, got into the car and drove back to the farmhouse where he told the owner what had taken place, and offered to pay for the horse. The farmer chuckled. "Think nothing of it. George and I are good friends, so I asked him to shoot that old horse and save me the trouble."

» »

A wonderful bird the frog are
Him ain't got no tail hardly any
And when him walk, him hop
Him sit on him tail which him
ain't got hardly any.

—The Big Wind, Fort Lauderdale, Fla.

» »

Sergeant: Hey, there, you Mose! Come back here. Suppose you do get killed, what of it? Heaven is your home."

Mose: "Yes, suh, Sarge, ah knows dat. But right now, ah ain't homesick." .

» »

The lawyer collapsed into a restaurant chair, suffering a devastating hangover.

"Can I fix you a bromo-seltzer?" asked the waiter sympathetically.

"Ye gods, no! I couldn't stand the noise!"

» »

Darby: I had an awful time but I finally got a barometer.

Joan: What on earth do you want it for?

Darby: This barometer will tell me when it's going to rain.

Joan: Such extravagance! What do you suppose the good Lord gave you the rheumatism for?

» »

Young and inexperienced father, gazing at triplets the nurse had just brought out: "We'll take the one in the middle."

FLOURS TO FIT EVERY FORMULA
★ Hard Spring Wheat
★ Hard Winter Wheat
★ 100% Whole Wheat
★ Cake Flours
★ Pastry Flours
A COMPLETE FLOUR SERVICE
RUSSELL-MILLER MILLING CO.
MINNEAPOLIS 1, MINN.
Millers of Occident, American Beauty and Other Bakery Flours

The Rodney Milling Co.
13,000 CWTS CAPACITY
KANSAS CITY, MISSOURI
"Heart of America" FLOUR
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BOSTON OFFICE:
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White Crest Red Crest
Cake and Pastry Flours
J. C. L.
Sponge Cracker Flour
The J. C. Lysle Milling Company
Leavenworth, Kansas

The Moundridge Milling Co.
FAMILY FLOUR — BAKERY FLOUR
CRACKER FLOUR
SPECIALTY PRODUCTS
General Offices: MOUNDRIDGE, KANSAS

Evans Milling Co.
INDIANAPOLIS, IND., U. S. A.
Manufacture Kiln-Dried
WHITE CORN PRODUCTS
Capacity, 16,000 Bushels

Serving the Metropolitan Buyers for Over 40 Years With the
HIGHEST QUALITY FLOURS PRODUCED
NEW JERSEY FLOUR MILLS CO.
CLIFTON, N. J.
Renown for Our Prompt and Efficient Service
Only 11 Miles from New York City

KING MIDAS FLOUR
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is Milled from

FINE HARD MILLING WHEAT

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Fortunate is the product the advertising claims for which are so apparent to the consumer as to inspire his confidence in and acceptance of that product.

All we claim for SAPPHIRE FLOUR is that it is milled from what is recognized as the finest hard milling wheat produced in this country under constant, conscientious, and modern milling practice, and we offer SAPPHIRE FLOUR to our customers confident in the belief that the claims made will stand the acid test of consumer use.

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"It's the Wheat"

MONTANA SAPPHIRE FLOUR

"We have contributed to the American Bakers' Foundation."

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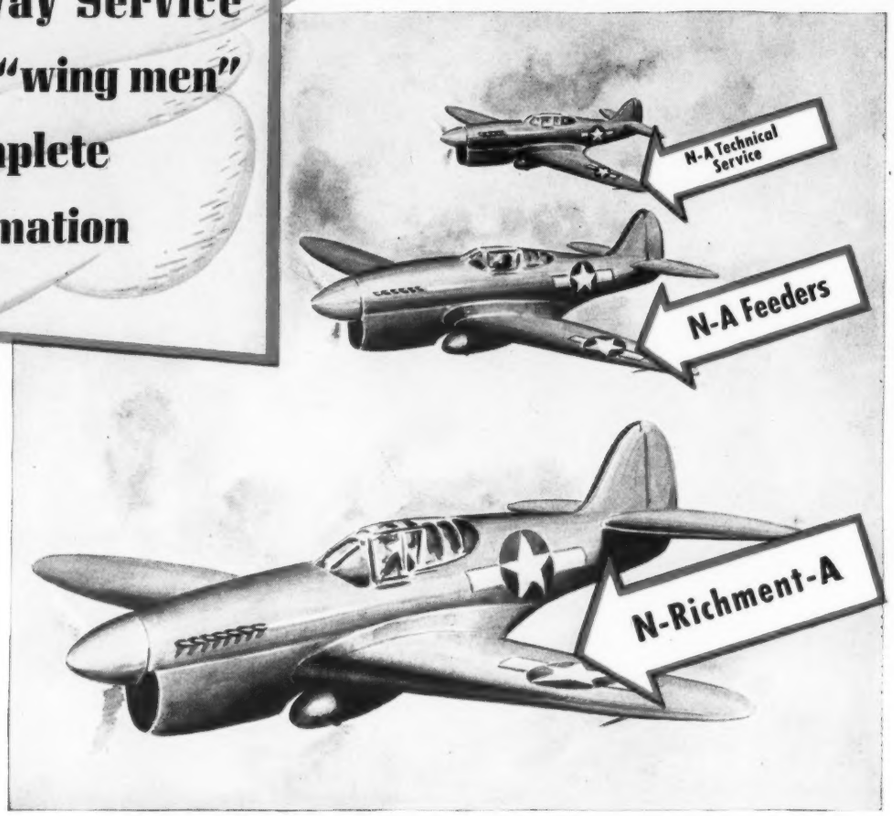
N-A's 3-Way Service provides the "wing men" to complete the formation



TYPE 4
N-RICHMENT-A
This type has ferrum reductum as its source of iron, and when fed at the rate of ¼ oz. of N-RICHMENT-A to 100 lbs. of flour, there is practically no ash addition from the concentrate.

TYPE 4-A
N-RICHMENT-A
This type is the same as Type 4 except that for increased accuracy of control, it is compounded to be fed at the rate of ½ oz. of N-RICHMENT-A to 100 lbs. of flour.

TYPE 5
N-RICHMENT-A
This type has sodium iron pyrophosphate as its source of iron, and for increased accuracy of control, it is compounded to be fed at the rate of ½ oz. of N-RICHMENT-A to 100 lbs. of flour.

• Just as the individual plane is highly vulnerable, so too is an enrichment program based on the concentrate alone. N-A's 3-Way Service — N-RICHMENT-A, technical experience and feeders — provides the "wing men" to complete the formation.

N-RICHMENT-A is compounded to give you the best in concentrates, and, in addition, N-A's field service men and enrichment feeders bring you technical advice based on long experience in the milling field and equipment designed especially for the job.

For *more* protection in *every* direction, why not ask your local W & T representative for further details on Novadel-Agene's 3-Way Enrichment Service.

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AGENE NOVADELOX
FOR STANDARDIZED
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NA-113

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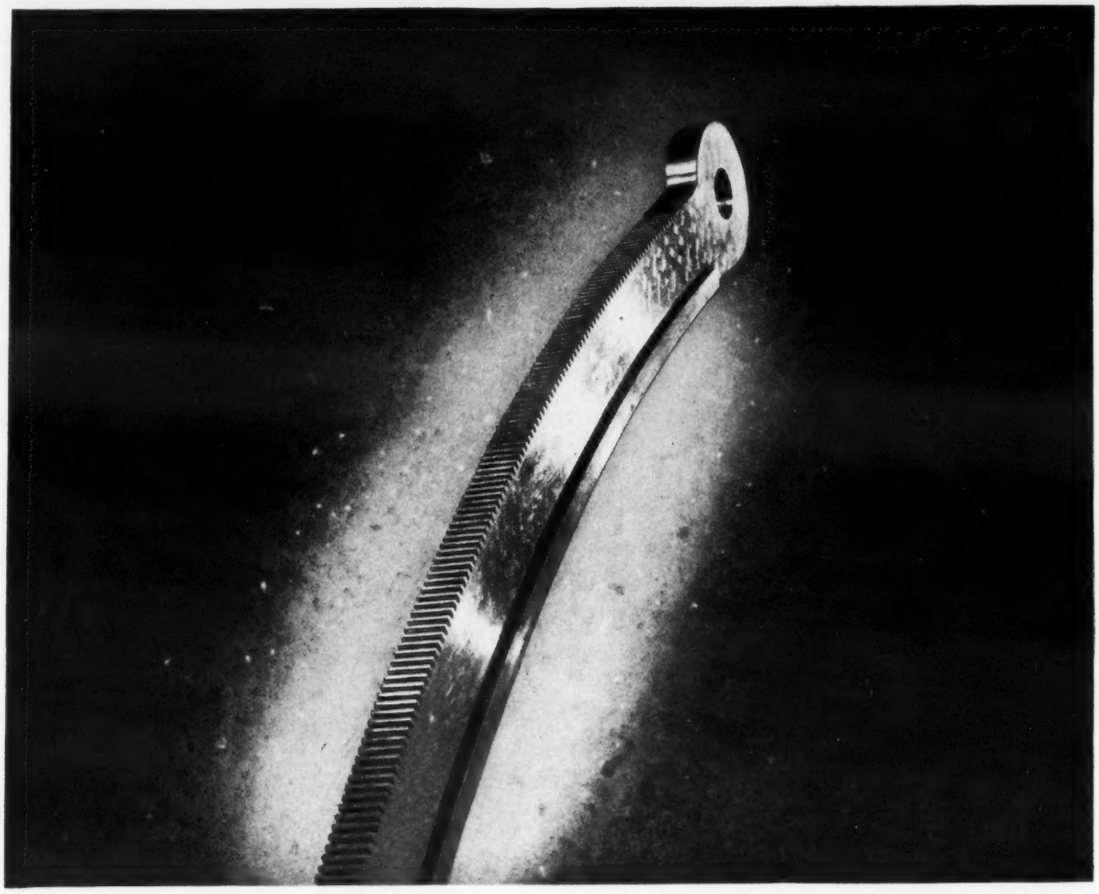


Cure for the "creeps"

This peculiar piece of metal—part of a gunsight General Mills makes for navy cruisers—once had a troublesome ailment . . .

The "creeps"!

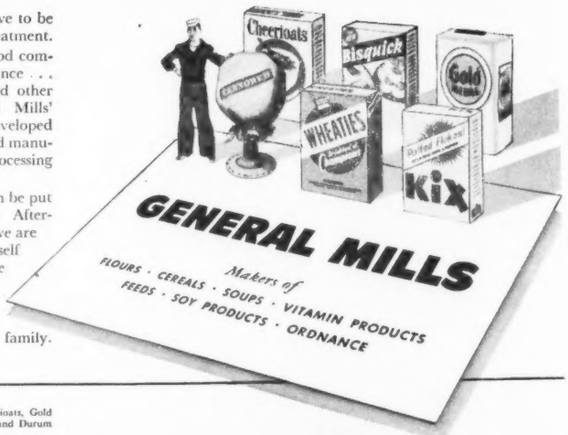
To work properly, it had to be machined to an almost unbelievable smoothness and accuracy. But often, after a piece was finished, the metal would change in size ever so slightly . . . "creep" an infinitesimal amount . . . and it would be useless.

The "creeps" had to be licked and we licked 'em, strangely enough, by freezing each piece at 100° below zero just before it was given its finishing touches. For some unexplainable reason, the terrific cold "set" the metal, stopped its creeping.

Actually, 25 parts of the gunsight call for workmanship so fine they have to be given this special sub-zero treatment.

It may seem strange that a food company can turn out naval ordnance . . . gunsights, torpedo directors, and other secret devices . . . but General Mills' engineering skills were well developed before the war by the creation and manufacture of many intricate food processing and packaging machines.

We are glad this experience can be put to good use during the war. Afterwards, what we know and what we are learning every day, will reflect itself in many new products . . . some you would never now associate with General Mills . . . new ideas to help make life more pleasant for you and your family.



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